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PERSONALITY AS REVEALED BY MENTAL TEST SCORES AND BY SCHOOL GRADES

HENRY F. ADAMS, LOUIS FURNISS AND L. A. DEBOW[1]

University of Michigan

With the growing emphasis placed by Universities on student personnel problems, a compensating need for greater care in selection and retention of students has developed. The old system of admission, based upon pre-university grades, has apparently not proved to be entirely satisfactory. The authorities have, consequently, been searching for other measures and other criteria which might aid in the diagnosis of the individuals seeking admission to the institution. Among other methods of measurement, the so-called "mental," or "psychological," or "intelligence" tests have been used. Whether these methods of measurement will prove superior to scholastic grades, time might tell. For if the nature of an organism is determined by the dual processes of what gets in and what gets out, the character of an organization is likewise fixed by the requirements for admission and the requirements for rejection. The present movement aims at reducing rejections to a minimum by more careful means of selection.

What the mental test reveals about the nature of the one who takes it is, consequently, a matter of no little collegiate impor-

[1] Mr. Furniss directed the personality ratings and performed the major part of the necessary computing. He also obtained the school grades from the recorder's office and determined the coefficient of correlation between school grades and mental test scores. Mr. DeBow made the 126 scatter tables from which the correlation coefficients between grades and traits, and test scores and traits were computed. The senior author accepts entire responsibility for designing the experiment, for computing the correlation coefficients, for the phraseology of the present article, and for the conclusions reached.

tance. The problem has evidently appealed to the mental test practitioners but little, to judge by the content of the literature, for the writer has succeeded in finding but 8 articles which bear upon the point. And in three of these, the authors give correlations between school grades and traits, or between test scores and qualities, but not between school grades and traits, and test scores and traits. There are consequently but 5 articles left which enable us to compare the same individuals with respect to the two situations. A brief summary of these articles follows:

Pressey (1), investigating 116 cases of seventh grade pupils, found the coefficient of correlation between school attitude (industry and application) and school marks to be 0.69; school attitude and intelligence tests, 0.55.

Working on the caution factor, Brown (2) found a correlation coefficient between school grades and caution of 0.21; the corresponding coefficient between intelligence test scores and caution was 0.42.

Without offering statistical evidence, Laird (3) concludes, "That those who classed themselves as pessimistic, and were also so classed by their fellow students were invariably above the average, very much so, in scholarship. Their average in intelligence (evidently the results obtained from tests) was below the class average."

Sangren (4) found the correlation between scholarship and scholarship qualities to be 0.98; between intelligence (tests) and scholarship qualities to be 0.95. Between scholarship and citizenship qualities, the correlation was 0.92; between intelligence (tests) and citizenship qualities, it was 0.77. Scholarship qualities included methods of work, application, industry and attitude, and assimilation of new ideas. Citizenship qualities were physical vigor, social and personal qualities, leadership, and team work. Individual correlations for these separate qualities were not given.

The most inclusive piece of work on the types of personality disclosed by school grades and by test scores is found in Webb's (5) oft quoted but little known monograph. Webb obtained

TABLE 1

QUALITY	GRADES	TESTS
Cheerfulness	0.24	0.49
Quick oscillation of mood	−0.59	0.29
Occasional extreme depression	−0.25	−0.17
Readiness to become angry	−0.77	0.30
Promptness of recovery from anger	0.55	0.09
Liability to extreme anger	−0.45	0.22
Aesthetic feeling	0.81	−0.15
Humor	0.27	0.30
Desire to excel at performances	0.57	0.19
Tendency to impose will on others	−0.56	0.30
Eagerness for admiration	−0.49	0.27
Belief in own powers	−0.13	0.12
Self esteem	−0.38	0.07
Superciliousness	−0.73	0.23
Fondness for large social gatherings	−0.15	0.50
Fondness for small social gatherings of intimate friends	0.52	0.01
Impulsive kindness	0.27	0.19
Kindness on principle	0.98	−0.01
Corporate spirit (loyalty)	0.39	0.58
Trustworthiness	1.04	−0.05
Conscientiousness	0.90	−0.25
Interest in religious topics	0.71	−0.35
Influenced by sentiments of associates	0.26	−0.13
Desire to be liked	0.25	0.44
Wide influence	0.63	0.40
Intense influence	0.60	0.22
Tact	0.66	0.08
Mental work on studies	0.65	−0.18
Mental work on pleasures	−0.01	0.94
Bodily activity during business hours	0.14	0.36
Bodily activity for pleasure	−0.03	0.92
Works for the future	0.68	−0.20
Overcomes obstacles	0.55	−0.03
Tendency not to abandon a task from mere changeability	0.74	−0.18
Quick apprehension	0.50	0.27
Profound apprehension	0.77	0.00
Common sense	0.88	0.10
Originality	0.55	0.19

TABLE 1—*Continued*

QUALITY	GRADES	TESTS
Pure mindedness	0.71	−0.31
Physique	0.43	0.17
General excellence of character as judged by lecturers	−0.01	0.74
General excellence of character as judged by prefects—fellow students	0.69	−0.06
Examination ability		0.06
Athletics	0.43	−0.03
General intelligence tests	0.06	
"G" factor	0.36	−0.17
Strength of will	0.67	0.34
Excitability	−0.27	0.24

personality ratings on a group of 196 men attending a Teachers' Training College. He also gave them mental tests and obtained their school grades from the institution they were attending. With these data, he was in a position to determine the correlations between school grades and traits of personality and also the correlations between test scores and the same group of traits. His results are given in full in table 1.

This concludes the historical summary. It is probable that some articles have escaped the attention of the writer, but those given represent an unselected sampling.

The results are pleasingly consistent. Almost without exception, they show that the one who excels in school grades possesses desirable qualities to a greater extent than the one who proves facile in mental tests. Webb shows that the outstanding feature of the one who excels in mental tests is his pursuit of pleasure. Second in importance is the good impression he makes on casual acquaintances, such as lecturers. He also seems to be somewhat fonder of a crowd and less critical in his tastes than the one who obtains good grades.

The one who earns good school grades is found to possess a considerable number of desirable attributes. He is trustworthy and conscientious, kindly, possessed of common sense, has aesthetic feeling, controls his temper, has mental profundity

and interest in fundamental and serious topics, and perseveres. He seems to be the more solid type of citizen than the one who does well in the tests, a point which Sangren's results reinforce. Webb's table of correlations furthermore suggests that the intelligence tests are not as good a measure of intelligence as are grades. In view of the vogue of the mental tests, these results are surprising. However, speculation will be deferred until after the description of our experiment.

The experiment was performed at the University of Michigan during the second semester of the year 1925–1926. The subjects were students in the course in Elementary Psychology, practically all being Sophomores and Juniors, and the number of men and of women being approximately the same. Complete records were obtained from 96 subjects. Each subject was ranked by himself and 9 or more house mates who had lived with him for at least a year. When these rankings had been finished, a task which lasted three weeks, the same persons were ranked a second time by the same individuals on the same list of traits. Rankings on a total of 63 characteristics were obtained. To facilitate the ranking, the subjects were divided into groups of 10, 11, or 13, as this was found to be the number living together in the same fraternity or sorority house, or dormitory. Eventually, then, we had at least 20 rankings for each person. The average of these 20 rankings was used to determine the position of the individual in the group. Unless the average of the first rankings and the average of the second rankings for the group on a trait showed a correlation of $+0.70$ or over, the data for the group on that trait were rejected.

School grades were obtained from the Recorder's office. In all cases, the grades for at least one full year were used, and in most cases the grades for two years were employed. Honor points were divided by hours, thus giving a ratio.

The mental test used was the Michigan Modification of the Army Alpha, a spiral omnibus test in form. All data obtained, the trait ratings, the school grades, and the mental test scores were divided into seven classes in terms of frequency distributions, and the correlation coefficients computed by the Pearson

TABLE 2

TRAIT	GRADES	TEST
Industry	0.78	0.08
Steady worker	0.98	0.19
Procrastination	−0.58	−0.19
Gives up easily	−0.71	−0.14
Obstinate	0.45	0.41
Impulsiveness	−0.04	0.00
Resolute	0.88	0.33
Emotional	−0.21	−0.03
Touchy	0.16	−0.06
Critical	0.56	0.30
Tolerant	−0.11	−0.11
Joyful	−0.77	−0.08
Moody	0.16	0.11
Tendency to worry	0.12	−0.12
Easily consoled	−0.30	−0.29
Easily reconciled	−0.34	−0.34
Easily persuaded	−0.73	−0.35
Likes change	−0.38	−0.03
Works for the present	0.06	0.48
Interest in persons	−0.07	−0.07
Quick mentally	0.74	0.53
Deep mentally	0.82	0.19
Bright	0.77	0.36
Knowledge of human nature	0.30	0.43
Common sense	0.69	0.14
Broad minded	0.00	0.10
Independent	0.56	0.10
Sense of humor	0.11	−0.01
Talkative	0.04	0.07
Tactful	0.11	0.22
Observation	0.51	0.30
Popularity	0.14	0.14
Memory	0.77	0.38
Tries to please others	−0.18	−0.16
Thrifty	0.63	0.05
Domineering	0.48	0.40
Sympathetic	0.08	0.00
Natural manner	0.08	−0.32
Self consciousness	−0.08	−0.25
Demonstrative	−0.10	−0.03

TABLE 2—*Continued*

TRAIT	GRADES	TEST
Truthful	0.65	0.12
Trustworthy	0.44	0.15
Courage	0.62	0.30
Likes companionship	−0.33	−0.18
Gossips	−0.15	0.01
Talks about himself	0.14	0.30
Reads much	0.62	−0.14
Pays compliments	−0.28	0.01
Politeness	0.15	0.15
Absent minded	−0.29	−0.26
Neatness	0.69	0.34
Punctuality	0.71	0.33
Moral courage	0.63	0.33
Generous	−0.21	0.00
Originality	0.40	0.16
Prudence	0.70	0.04
Self confidence	0.66	0.45
Quick temper	0.26	0.07
Optimistic	−0.01	−0.01
Calm in emergencies	0.71	0.21
Strength of will	0.82	0.30
Conscientiousness	0.71	0.00

Product Moment method. All coefficients have been corrected for attenuation, for our initial purpose was to compare our results with those of Webb, and he gives the corrected coefficients.

An idea of the amount of correction necessary may be gained from the size of the reliability coefficients. First and second personality rankings showed an average consistency represented by the coefficient 0.85. Consistency of school grades from year to year was represented by the coefficient 0.66. Consistency for the mental test, since only one was given, was determined by correlating the even with the odd questions. The coefficient was 0.84. The correlation between grades and test was 0.25, being the same for both sexes. The correlations obtained are shown in table 2.

In Webb's experiment and ours, twelve traits occur in common. Table 3 shows the correlation coefficients obtained in the two pieces of work.

In only two cases out of the twelve is there disagreement in tendency indicated, a similarity quite remarkable when we

TABLE 3

QUALITY	ADAMS GRADES	TEST	WEBB GRADES	TEST
Touchy, liability to anger	0.16	−0.06	−0.77	0.30
Joyful, cheerful	−0.77	−0.03	0.24	0.49
Quick mentally	0.74	0.53	0.50	0.27
Deep mentally, profound	0.82	0.19	0.77	0.00
Sense of humor	0.11	−0.01	0.27	0.30
Common sense	0.69	0.14	0.88	0.10
Tactful	0.11	0.22	0.66	0.08
Domineering	0.48	0.40	−0.56	0.30
Trustworthy	0.44	0.15	1.04	−0.05
Originality	0.40	0.16	0.55	0.19
Strength of will	0.82	0.30	0.67	0.34
Conscientious	0.71	0.00	0.90	−0.25

TABLE 4

QUALITY	GRADES	TESTS
Critical	0.56	0.30
Quick mentally	0.74	0.53
Deep mentally	0.82	0.19
Bright	0.77	0.36
Common sense	0.69	0.14
Observation	0.51	0.30
Memory	0.77	0.38
Reads much	0.62	−0.14
Originality	0.40	0.16

remember that different tests were used, and that Webb's subjects were British and ours American. It should be noted, furthermore, that the disagreements occur in the case of the emotional traits which are said to be peculiarly difficult to rate. On the whole, the agreement in tendencies indicated is very gratifying.

If we bring related traits together into separate tables, conclusions concerning certain broad classifications can be made. We shall start with the group of mental qualities (see table 4). Here the evidence all points in one direction. Those who earn satisfactory grades are superior to those who obtain high test scores in every single mental quality in the list, without exception. Even the pet of the mental test advocates, mental

TABLE 5

QUALITY	GRADES	TESTS
Interest in persons	−0.07	−0.07
Knowledge of human nature	0.30	0.43
Popularity	0.14	0.14
Tries to please others	−0.18	−0.16
Independent	0.56	0.10
Sympathetic	0.08	0.00
Demonstrative	−0.10	−0.03
Likes companionship	−0.33	−0.18

TABLE 6

QUALITY	GRADES	TESTS
Obstinate	0.45	0.41
Broad minded	0.00	0.10
Talkative	0.04	0.07
Natural manner	0.08	0.32
Self consciousness	0.08	0.25
Gossips	0.15	0.01
Talks about himself	0.14	0.30
Politeness	0.15	0.15

quickness, is somewhat better determined by school grades than by tests. In the case of depth, or profundity, the evidence is clear cut and much to the advantage of the scholar. The average of all the correlations of the traits with grades is 0.65; with mental test scores, 0.25. The corresponding averages for Webb's four mental traits are 0.68 and 0.14 respectively. Such close agreement between two independent researches is

remarkably good proof of a significant tendency. The implication is, that when ratings are used as a standard, school grades are a better measure of mentality than are the scores received in an intelligence test.

TABLE 7

QUALITY	GRADES	TESTS
Impulsive	−0.04	0.00
Touchy	0.16	−0.06
Emotional	−0.21	−0.03
Joyful	−0.77	−0.03
Moody	0.16	0.11
Worrier	0.12	−0.12
Humor	0.11	−0.01
Temper	0.26	0.01

TABLE 8

QUALITY	GRADES	TESTS
Steady worker	0.98	0.19
Industry	0.78	0.08
Truthful	0.65	0.12
Trustworthy	0.44	0.15
Conscientious	0.71	0.00
Courageous	0.62	0.30
Moral courage	0.63	0.33

TABLE 9

QUALITY	GRADES	TESTS
Stick-to-it-iveness	0.71	0.14
Resolute	0.88	0.33
Moral courage	0.63	0.33
Strength of will	0.82	0.30

The traits representing social relationships, together with their correlations with school grades and test scores, are given in table 5. Here, no highly significant differences appear. The greater independence and the very slightly greater disin-

clination for companionship of those who receive good grades, may be suggestive since Webb's results point in the same direction, of a somewhat more extroverted type of individual who excels in mental tests.

The correlations with the individual or personal qualities, as represented by table 6, bring out nothing of a striking or significant nature.

Evidently the two forms of test are not differential with respect to the traits in question.

Emotional qualities, with two exceptions, also appear to be barren of significance. (See table 7.)

The one who earns good grades tends to be somewhat lacking in joyfulness of disposition, a fact which may be related to Laird's findings regarding pessimism. Webb's correlations, though numerically very different from ours, agree in ascribing the greater amount of cheerfulness to the one who excels in mental tests. On the other hand, the one who received good school grades is more inclined to keep his head in an emergency.

When we turn to a consideration of dependability and reliability, certain noticeable differences appear. (See table 8.)

The superiority of those who obtain good school grades is clear cut in all of these traits. The average of all the correlations with grades is 0.69, with test scores 0.17. Webb's correlations for the two traits common to both investigations are 0.97 and −0.15 for grades and test scores respectively. Pressey, it will be recalled, found a correlation of 0.69 between industry-application and grades, of 0.55 between industry-application and test scores. The trend is the same in all cases: school grades are superior to test scores for selecting dependable, reliable individuals.

A scrutiny of the more definitely volitional qualities also discloses certain significant differences. (See table 9.)

Evidently, the person with "will power" is better selected by the school grades than by mental tests. Webb's correlations for the two traits common to the two experiments average 0.64 for grades, 0.11 for test scores.

There is also some evidence that the school grades are some-

what more effective in selecting the foresighted type of person, the averages being 0.56 and 0.26 respectively. Webb's correlations between working for the future and school grades is 0.68, with test scores the correlation is −0.20. Here again is an agreement in tendency, though the absolute sizes of the coefficients are quite different.

Summarizing the preceding paragraphs, we may say that in practically all cases, independent investigations carried on by different experimenters, agree in showing, when personality ratings are used as the standard of comparison,—

1. That school grades are a better measure of mentality than are mental tests.

2. That school grades are a better measure than intelligence tests of foresight.

3. That school grades are better selective instruments than mental tests for determining the reliability and dependability of individuals, in other words, the more solid type of citizen.

4. That school grades are better instruments for selecting the resolute, determined sort of person than are mental tests.

5. That school grades are measures of both mentality and character. Mental tests measure only quickness of intelligence, and do a second rate job at that.

One's attitude towards the foregoing conclusions will necessarily be determined by his viewpoint concerning the reliability and accuracy of ratings. Unfortunately, little of scientific value on the validity of ratings has appeared in the literature. Most writers beg the question by the use of the old stock phrases, "It is obvious," "of course," etc. Rugg's (6) analysis of the Army rating scale is probably the most serious and painstaking effort in this direction. But unfortunately, if we grant his first conclusion, i.e., that the Army rating scale is practically useless for giving approximately accurate measures of traits, then the rest of his work becomes meaningless. As a matter of fact, it should have been obvious that the man to man scale involved two serious fallacies. In the first place, it rests upon the assumption that a man is a static, unchanging, unvarying phenomenon. This is equivalent to denying, in measurements

of personality, the possibility of deviations in successive measurements of the same person in the same quality. Yet deviations in other measurements are accepted and expected. If they do not appear, we think there is something wrong with the apparatus. Psycho-physical measurements, reaction times, memory experiments, and many other examples might be mentioned in proof of the point. In the second place, the scale rests upon the assumption that all of the persons acting as raters should see the same phenomenon in the same way. This in turn is a violation of one of the fundamental laws of perception. On both counts, the man to man scale was doomed to failure. Consequently, conclusions based upon data derived from man to man ratings are bound to be fallacious. Yet Rugg's article has been responsible for much of the current thinking relative to the value of personality ratings.

It will probably be admitted by many that the starting point in our search for truth is to be found in consistency. Repeated measurements of the same phenomenon, will, if they are accurate, show a high degree of consistency. This does not mean, however, that consistent measures are necessarily accurate, for a constant error may pervade all of them. But at any rate, consistency of measurements is the first of a number of criteria which must be sought in evaluating accuracy.[2] However, the consistency of the individual measurement in a series is of less importance than the consistency of a series of averages computed from the same measurements. And in a general way, the consistency of the averages will vary with the number of cases involved. This is but a restatement of the formula for the probable error. Hence the agreement between such averages must be considered in terms of the number of cases involved. It consequently seems probable that the high agreement between scores obtained from two trials with the same mental test taken by the same person should be high, for each test score is obtained from a considerable number of separate problems.

[2] It is the intention of the writer to discuss this problem in some detail in the near future.

Hence, agreement means little when divorced from the number of cases involved in the final average. For this reason, the coefficients of reliability given above are misleading. The agreement between first and second personality ratings, 0.85, was derived from averages made up of ten cases each. The agreement of 0.66 for school grades was obtained from an average of approximately 10 courses a year. The agreement of 0.84 for mental tests was based upon averages derived from 100 separate elements. Therefore, the reliabilities are not directly comparable.

Consequently, we shall assume that the three measures used, rankings, school grades, and test scores, give moderately reliable indices of the factors measured. Our subsequent arguments will be based upon that assumption.

The first feature that strikes our attention is the consistent trend revealed no matter what form of mental test has been used, and no matter whether the English or American system of education has been used. One type of personality seems to do better in obtaining satisfactory school grades, another in getting good test scores. Is there any rational explanation for this difference?

Obviously, there are both differences of material and differences of method involved. A mental test usually presupposes a body of knowledge of a more or less standardized character, though in some, rote memory and simple reasoning are also demanded. But in all cases except the rote memory, the individual is asked to select and use something which is already a part of his mental equipment. His ability to select the proper element and to do so quickly seems to be the response demanded. He is ordinarily not asked to do anything new. He is not even asked to learn anything much longer than a telephone number. He is requested to play a part, the lines of which are already learned.

In getting school grades, on the other hand, he is asked to learn something new. He is expected to assimilate a great amount of material, to understand it, and to be able to reproduce it in his own words. The material must become part of

himself. He must get something and then show his ability to use what he has obtained. Surely this is very different from what is demanded in a mental test. And we believe that the ability to tackle a new job, to adapt to it, to learn it and then to use it demands very different capacities from merely using the familiar. Yet the materials covered are usually abstract, not vital in the ordinary use of the term, and not of immediate practical importance.

Ratings on intelligence are quite probably different in their bases from either of the foregoing. True it is that a student's impression of the mentality of another is influenced by the other's school grades, so here we are dealing with an element in common in the two situations. But otherwise the impression seems to involve practical reactions to practical situations which are certainly not covered in either the class room or the mental test situation.

If we can isolate the most outstanding elements in the three situations, we should describe the mental tests as involving mainly selective recognition or recall; school grades as involving the ability to assimilate at any chosen rate new material of a more or less abstract character and to reproduce it; ratings as involving the ability to assimilate and reproduce material of a more practical nature. It is probable that each test is good in its place, but that they are not necessarily interchangeable.

Certain other differences between school grades and test scores are also outstanding. First among these is the time element involved. A good score in a mental test may be earned by a comparatively few moments of intensive effort. As the test is ordinarily given there is no possibility of "self punishment," no great amount of fatigue which must be fought against, no waning interest and no monotony of task to dampen the ardor. It is, from first to last, a sprint, which may appeal to the sporting proclivities of the participant, but does not test his more solid virtues. To earn school grades, however, more or less consistent effort for a semester is necessary. The thrill of short time competition is lacking; the student must often spur himself to the task, must resist outside distractions,

must master fatigue, boredom and disinclination. This kind of situation, when it endures for some considerable time, demands resolution, perseverance, and strength. Consequently, it seems reasonable that this type of situation should measure with some degree of accuracy the above mentioned qualities.

In the second place, because of the emphasis placed upon speed, the test, certainly in the group form, is highly competitive. And we know, from a host of experiments, that the poorer subjects are more strongly motivated by competition than are the good ones. Furthermore, the socially inclined are more strongly influenced by the presence of others than are the introverted individuals.

But, someone will object, the results of tests and school grades show a high correlation, consequently, they must measure the same thing. We are perfectly willing to grant that the correlation between test scores and grades is high in the grades, and probably highest in the lowest grades. In the University, the correlations are much lower, in the present experiment 0.25 and in Webb's 0.06, though these are unusually low values. The average is possibly somewhere around 0.45. This is a mere casual impression which has little statistical reliability.

There are at least two possible explanations of this situation. In the first place, it is possible that the units of work are small in the grades and increase in magnitude the further one goes scholastically. As a corollary of this, the length of the test or examination period may have some bearing on the case also.

In the second place, it may be that the mental test results, when taken seriously, bring about a method of instruction by the grade teachers which gives a high correlation with the test results. If this is the case, it would seem to be a very unfortunate system, in that it fosters tendencies towards irresponsibility and undependability on the part of the students. For these are just the qualities that we are trying to get rid of, not only in the grades but also in the institutions of higher learning as well.

An unpublished article by G. M. Whipple has some bearing on the question. Some eight or ten years ago, those students

who had been warned or put on probation at the University of Michigan were given a mental test to determine their "mental level." Only 6 per cent of those tested, and there were several hundred, obtained scores on the tests sufficiently low to show "that they did not belong in the university." Answers to questionnaires passed out at the same time showed that 20 per cent of the failures were attributed by the students to "hard luck,"—a term used loosely to include circumstances not under the immediate control of the student. Such things as illness, accidents, home difficulties causing worry, etc., were included. Eighty per cent of the reasons given were for preventable causes, such as too good a time, crowd at the house did not study, dances, movies, love affairs, etc. These are directly traceable to irresponsibility, untrustworthiness, weakness of will and other elements of faulty character. A mental test plus an elaborate questionnaire confirmed what had already been brought out by the school grades.

In conclusion, we would like to speculate about the character of the institution of higher learning which had used mental tests for a series of years as an essential part of the requirements for admission. Assuming that the experimental results represent an approximately accurate picture of the one who does well in mental tests, we may be very sure that the University would soon become a haven for the slack, the foolish, the playful, the indolent and the slothful. Such a personnel would add very materially to the unpleasant duties of the deans and other officers of administration, would cause an increased percentage of students sent home for various reasons, or an undesirable lowering of the university standards until it would approximate the mental level of the finishing school.

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THE RE-STANDARDIZATION OF A POINT PERFORMANCE SCALE

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This is a preliminary report on the standardization as a whole of the point performance scale described in the December issue of THE JOURNAL OF APPLIED PSYCHOLOGY of 1925 (1). This standardization has been made possible by a grant from the Commonwealth Fund, made through the Psychology Department of the University of Minnesota.

The scale described in 1925 consisted of the following tests:

1. Knox Cube
2. Seguin Form Board
3. Two-figure Form Board (time)
4. Casuist Form Board (time and error combined)
5. Manikin (score)
   Feature-Profile (time)
6. Mare and Foal (time)
7. Healy Picture Completion I (score)
8. Kohs Block Design (score)

These tests had been selected from among those standardized by other investigators upon the basis of their discriminative value. The tests that marked off a given chronological age group from adjacent age groups most effectively were assumed to be the best tests of "general intelligence" for that age level. This discriminative value was calculated from the formula (2)

$$D.V. = \frac{Av._2 - Av._1}{\frac{P.E._2 + P.E._1}{2}}$$

in which D.V. is the discriminative value, $Av._2$ is the average of the higher age group, $Av._1$ is the average of the lower age

group, $P.E._2$ is the probable error of the distribution of the higher age group, and $P.E._1$ is the probable error of the distribution of the lower age group.

The Porteus Maze Test was omitted from the earlier scale solely because no reliable measures of variability were available. Such as we had obtained from clinic cases indicated that it was one of the most valuable of the performance tests yet standardized. The present scale consists of the eight tests of the 1925 scale plus the Porteus Maze Test.

The subjects used in the standardization of this scale were approximately 1100 public school children[1] from a middle class district of St. Paul. There were not less than 94 subjects nor more than 114 subjects at any given age level. The examiners were Miss Alverta Buchta, who worked full time on the project, Miss Karla Jorgenson, who worked part time on it, and the writer.

MATERIALS

1. Knox Cube: Five 1 inch wooden cubes, similar in every respect.

2. Seguin Form Board: Stoelting catalogue No. 27156. Insist upon a properly finished specimen, in which board and insets are smooth to touch. The board should have a dark stain; the insets, a light finish.

3. Two-figure Form Board: Stoelting catalogue No. 27167. It is necessary to examine the parts to make sure that they slip readily into place when similar pieces are interchanged. It is often necessary to smooth one side of a piece with sand paper to give more play.

4. Casuist Form Board: Stoelting catalogue No. 27168. Here again it is necessary to uses and paper if supposedly interchangeable parts cannot be interchanged readily.

[1] We are indebted to the courtesy of Mr. S. O. Hartwell, Superintendent of the Department of Education, and to Mr. L. L. Everly, Director of Research for permission to give these tests, and to the principals, teachers and pupils of the schools in which the testing was done for the hearty coöperation which has made it possible to carry out the project to a successful conclusion.

5. Manikin, Stoelting No. 27170. Feature-Profile, Stoelting No. 27183.

6. Mare and Foal, Stoelting No. 27154.

7. Healy Picture Completion I, Stoelting No. 34053. The following order for the arrangement of the blocks was fixed upon by Dr. Florence Goodenough, then of the Minneapolis Child Guidance Clinic, and the writer. For convenience, the numbers are written on the backs of the blocks.

Top row: 1, bucket; 2, M. bottle; 3, wheel; 4, blank, 5, pipe; 6, shoe; 7, dog; 8, purse; 9, b. window; 10, fruit; 11, tie.

Second row from top: 12, cup; 13, knife; 14, chicken; 15, blank; 16, hatchet, 17, blank; 18, basket; 19, blank; 20, pumpkin; 21, blank; 22, s. bird; 23, football; 24, baby.

Third row from top: 25, baseball; 26, cat; 27, blank; 28, candle; 29, bottle; 30, hat; 31, blank; 32, fish; 33, glove; 34, mouse; 35, sprinkling can; 36, blank.

Bottom row: 37, flowers; 38, d. cat; 39, blank; 40, f. bird; 41, books; 42, blank; 43, c. window; 44, clock; 45, scissors; 46, stool; 47, cage; 48, s. cat; 49, log; 50, cherries.

8. Porteus Maze Test: Porteus mazes for five years to Adult II, inclusive.

9. Kohs Block Design Test. On the back of design II, paste a red one inch square. On the back of design I paste a one inch square, the upper half of which is yellow, and the lower half, red. As the blocks become soiled with use, they can be replaced at small cost with sets obtained from toy departments.

We have recorded scores on 6 by 8 inch filing cards, ruled. A stop watch with a time-out attachment is more useful than one without, in cases where a child, apparently through with his work, goes back to it either to make a minor correction or to wreck the whole thing and start over.

PROCEDURE

We have found it convenient to stack the test material in the following order. Seguin form board on the bottom, two-figure form board next, Casuist form board next, Manikin and Feature-Profile and Mare and Foal next, Healy I next, with the

maze and Kohs material on top. The Knox cubes are placed directly on the table. The rest of the material is placed on the floor at the left of the examiner in such a position as to be hidden from the subject, while he is working, by the table. A low table is necessary for the younger children. It is absurd to expect a child who can barely reach the insets of the Seguin form board to make a valid score. The examiner should be seated opposite the subject for the sake of ease in handling the material.

Say, "These all start easy, and they all get hard. When they are easy don't get caught by thinking they are too easy, and getting careless, and when they get hard remember that no one ever makes a perfect score."

1. Knox Cube. Follow Pintner and Paterson. The order of difficulty of the series for our subjects seems to be A B C D E F I G H L K J. Caution against careless error before beginning the series and at the first failure. For subjects who tend to begin at the opposite end of the row, praise for correct sequence and give full credit, but continue to demonstrate with A until it is exactly reproduced. Place the fifth block always in the same position before the subject at the end of a series. Older subjects often think that the position of this block is part of the test, unless it is kept constant. The test is continued through three successive failures. Give it as the first test of the scale, and repeat in full as the last test of the scale. The score is the average of the two trials.

2. Seguin Form Board. Place the board with the star toward the subject for all three trials. Stack blocks, with the subject watching, in the following order: star (bottom) diamond, circle (top), at the upper right corner of the board, from the position of the subject; cross (bottom) lozenge, crescent, square (top), form the centre stack; elipse (bottom), triangle, oblong (top), at the upper left corner of the board. Say, "This is easy. The game is to see how fast you can do it. When I say 'go,' put these back as fast as you can. Ready. Go." For the second trial say, "That was good. Do you want to try it again? See how much faster you can do it this time. Ready. Go." For

the third trial say, "Good! It was —— seconds faster this time. Try it again. Perhaps you can do it still faster. Ready. Go." It is important that the blocks be taken out and stacked by the examiner rapidly, as a leisurely manner largely offsets the instruction to be fast. There should be no suggestion of hurry, however, as this tends to lower speed. Say nothing during a trial, unless, as in the case of some young children, the subject stops work altogether, and needs to be encouraged to continue. Record time for each of the three trials. Of the possible methods of scoring, the shortest time score of the three trials yields the highest discriminative values, and is therefore used in the present scale.

3. Two-figure Form Board. Say: "Turn and look at that picture (back of subject) so that you cannot see while I fix the next game." This does away with peeping, and does not meet with resistance from young, nervous children as does closing the eyes. Place the board with the cross to the right of the subject. Arrange the pieces as shown in Pintner and Paterson (3). Have subject again face the table. Say: "Put these back as fast as you can. Ready. Go." Allow not more than five minutes. Give help if it is needed after the time limit is reached. If the test is completed, record the time. If it is not, record any partial success such as "cross O.K." Note habits and methods of work for clues to kind and amount of praise necessary to obtain the subject's best effort throughout the remaining tests. The object of giving this test is to initiate the subject into puzzle-test procedure. It serves as a shock absorber for the young child, and for the nervous, self-distrustful adolescent. The score is not included in the final rating.

4. Casuist Form Board. Say: "Now turn your head again, so that you cannot see." Place the board with the two small circles toward the subject. Arrange the pieces as shown in Pintner and Paterson. Have the subject again face the table. Say: "Put these back as fast as you can. Ready. Go." Allow five minutes. Record time if the test is completed, or the number of forms completed at the end of five minutes if it is not.

5. Manikin. Say: "Turn your head again." Arrange pieces as shown in Pintner and Paterson. Have the subject again face the table. Say: "Now put these together." Record results. The following are the commonest solutions, arranged arbitrarily in approximate order of value.

a. No error.
b. Both legs going in the same direction. This is common only among the brighter children, and is scored as no error.
c. One or both arms up or out.
d. One reversal: arms interchanged or legs interchanged.
e. Arms interchanged and legs on edge, so that feet point upward.
f. Legs interchanged and one arm not exactly in socket.
g. One hand in socket.
h. Two hands in sockets.
i. Two reversals: arms interchanged and legs interchanged.
j. Arms or legs not used.
k. Legs interchanged or placed in line with outside line of body, hands in arm sockets.
l. One arm and leg interchanged.
m. Both arms and legs interchanged.
n. Only the head in place.
o. Complete failure.

If the subject has passed preceding tests at about the eight year level or better, omit the Manikin until the Feature-Profile has been given, as success on the latter presupposes success on the former.

Feature Profile. By this time the subject will blind without being asked to do so. Omit this test if the subject's score on the Manikin was below *c*. Say: "Put these together as fast as you can. Ready. Go." If the subject turns a piece face down, turn it face up again. Allow five minutes. Record time, if test is completed. If it is not, record partial success, as ear or profile.

6. Mare and Foal. Have subject blind. Turn the picture face down so that the pieces will fall out. Have the top of the picture toward you. The pieces will then be in the proper order, and will need only to be turned over. Turn picture face up and say: "Put these back as fast as you can." Record time.

7. Healy Picture Completion I. Take the picture from the box and place before the subject, but leave the blocks covered until instructions have been given, as impulsive subjects tend to begin work before they know what they are to do. Say: "See this picture of all these people doing different things. Parts of the picture are left out. Any one of these blocks (exhibiting them for a moment) will go into any one of these spaces. The game is to find the very best block for each space: Find the block that will make the most sensible picture. Do you see this man? What has he lost? (Help, if necessary, till the subject comprehends the situation presented in this practice picture.) All right. You find the wheel. Now you do the others the same way, and find the block for each space that makes the most sensible picture." Allow five minutes. It is often necessary to tell the subject that this is not a speed game. When the subject has finished, if time has not expired, say: "Now look it over and make sure that you have it all just the way you want it." Record the blocks in place when the test is completed. Turn the board face down on the table so that the blocks will fall out, and replace the blocks in the box according to their respective numbers. Score according to the values given in Pintner and Anderson (4).

8. Porteus Maze Test. Follow the procedure given in the 1924 Porteus manual (5), except the instructions as to inverting the maze when a total failure is followed by a success. We find an equally high discriminative value when the maze is not inverted, and the saving of time effected is considerable. Our norms are based upon the 1924 system of scoring, which with the adult mazes included yields a maximum mental age of eighteen.

9. Kohs Block Design Test. Follow the Kohs (6) procedure in introducing the blocks. Present trail card 1, the red square. Say: "Take these blocks and make a big red square, like this." Help if necessary either verbally or by putting the blocks in position. Present trial card 2 saying: "Now make one like this." Again give whatever help is necessary. Insist upon the design being in correct position. Present design I saying,

"Now make this one. This (pointing to the red) is supposed to be red, and this (pointing to the blue) is supposed to be blue." This procedure is necessary to keep brighter subjects from trying to find colors on the blocks to correspond with those of the design. Give whatever help is necessary for completion of the design, *after the time limit has elapsed.* Of course, in such case, no credit is given. Proceed in similar fashion with design II. Name the colors of the design. Help, if the design is not completed within the time limit. This extended practice is intended to offset in some measure the advantage possessed by those children who have had these sets of blocks as toys. Record time. Score, penalizing for excess time, according to the Kohs manual. *Do not try to count moves, or deduct for excess moves.* We find no significant difference in discriminative value between scores with errors recorded, and scores with excess moves ignored. The decision as to what constitutes a move must be largely individual, and as the performance of some subjects is much easier to score in this respect than that of others, we feel that the reliability of the test will be increased by limiting the scoring to time only. For our subjects the order of difficulty of the designs seems to be: I, II, III, IV, V, VI, VIII, VII, IX, XI, X, XII, XIV, XIII, XV, XVI, XVII. When the designs are presented in this order, we find that the test need be continued through only three successive failures instead of through the five recommended by the Kohs manual. A further saving of time can be effected by having the subject break up the design made of blocks that he has just completed while the examiner is reaching for the next design to be presented.

The minimum time for giving this performance scale as a whole has been found to be 35 minutes. The maximum time required for any subject is 90 minutes. The mode falls between 45 minutes and 60 minutes. Undue lengthening of time is more likely to be due to awkwardness of the examiner in handling the materials than to slowness of response on the part of the subject. However, when a slow subject is encountered, there is nothing to be done but to give all the time that is needed to obtain an adequate rating.

TABLE 1

Combined Point Scale

C.A.	KNOX I AND II		SEGUIN		CASUIST, (TIME)		MANIKIN AND FEATURE PROFILE		MARE AND FOAL		HEALY I		KOHS		MAZE		TOTAL
	Score	Points	Score	Points	Score	Points	Score	Points	Score	Points	Score	Points	Score	Points	Score	Points	
5	3.40	X	29.95	X	1 O.K.	X	Rev.	X	96.31	X	73.21	X	1.53	X	6.15	X	X
6	4.90	1.44	25.05	0.79	3 O.K.	0.98	Man. O.K.	0.80	69.71	0.66	159.88	1.31	4.95	0.85	7.08	0.87	7.70
7	6.10	2.78	21.50	1.75	O.K. 215′	1.84	Prof. O.K.	1.28	48.69	1.52	254.97	2.42	12.37	1.82	8.17	1.73	15.14
8	6.51	3.28	19.10	2.86	128	2.71	Prof. O.K.	1.97	39.78	2.35	333.98	3.32	19.78	2.78	9.25	2.59	21.86
9	6.91	3.78	17.33	3.79	96	3.33	F.P. O.K. 204	2.66	33.77	3.02	412.98	4.22	31.91	3.68	10.61	3.43	27.91
10	7.27	4.21	15.55	4.71	72	3.96	145	2.97	30.89	3.44	458.72	4.79	43.25	4.28	11.97	4.27	32.63
11	7.49	4.45	14.75	5.27	63	4.35	107	3.32	28.00	3.85	504.45	5.36	54.58	4.89	12.89	4.78	36.27
12	7.70	4.69	13.94	5.82	57.25	4.66	96.5	3.50	25.72	4.33	522.71	5.64	65.77	5.40	13.29	5.03	39.07
13	7.80	4.76	13.41	6.25	51.50	4.97	86.0	3.68	24.12	4.68	536.0	5.85	76.95	5.91	13.69	5.29	41.39
14	7.86	4.83	12.88	6.68	45.75	5.28	75.5	3.86	22.74	5.04	548.0	6.06	84.29	6.25	14 09	5.54	43.54
15	7.91	4.91	12.47	7.00	40.00	5.58	65.0	4.04	21.36	5.39	560.56	6.27	91.63	6.58		5.54	45.31

In table 1 are presented crude score norms and their respective point norms in units of probable error, for the entire scale. As the method of scale construction has been described in detail in an earlier article, it will not be necessary to give it again in this report. It is enough to state that inasmuch as the norms for the separate tests have been reduced to comparable units, probable error, it is possible to construct a combined scale simply by totaling the point norms for each age level. This combined point scale is given in the last column under *total*. The norms for the separate tests here presented are modified

TABLE 2

For converting point scores into years and months of mental age

	0	1	2	3	4	5	6	7	8	9	10	11
5							X	0.64	1.28	1.93	2.57	3.21
6	3.85	4.49	5.13	5.78	6.42	7.06	7.70	8.32	8.94	9.56	10.18	10.80
7	11.42	12.04	12.66	13.28	13.90	14.52	15.14	15.70	16.26	16.82	17.38	17.94
8	18.50	19.06	19.62	20.18	20.74	21.30	21.86	22.36	22.87	23.37	23.88	24.38
9	24.89	25.39	25.89	26.40	26.90	27.41	27.91	28.30	28.70	29.09	29.48	29.88
10	30.27	30.66	31.06	31.45	31.84	32.24	32.63	32.93	33.24	33.54	33.84	34.15
11	34.45	34.75	35.06	35.36	35.66	35.97	36.27	36.50	36.74	36.97	37.20	37.44
12	37.67	37.90	38.14	38.37	38.60	38.84	39.07	39.26	39.46	39.65	39.84	40.04
13	40.23	40.42	40.62	40.81	41.00	41.20	41.39	41.57	41.75	41.93	42.11	42.29
14	42.46	42.64	42.82	43.00	43.18	43.36	43.54	43.69	43.84	43.98	44.13	44.28
15	44.43	44.57	44.72	44.87	45.02	45.16	45.31					

where necessary to make them present a smooth curve. These modifications in the norms of the separate tests, naturally, have resulted in a smoothed combined curve.

In table 2 are given the values interpolated between the year norms of table 1. This makes it possible to convert the total point score of any subject into years and months of mental age.

In table 3 are given point values for all possible scores between the five year norm and the fifteen year norm of each test. By extrapolation, point values are assigned also to scores falling above and below these norms. The crude score for each test is

converted into points by means of this table. These point values are totalled and converted into mental age by reading from table 2. Intelligence quotients are then calculated in the usual manner.

For 119 subjects, Stanford-Binet IQ's were available. Between these and the IQ's of the present performance scale, the probable error of measurement was found to be 4.92, by

TABLE 3

For determining the point value of any score

Knox I and II

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
	−0.48	4.5	1.06	8.5	5.53
1.00	−2.30	5.0	1.55	9.0	6.05
1.5	−1.82	5.5	2.11	9.5	6.58
2.0	−1.34	6.0	2.67	10.0	7.10
2.5	−0.86	6.5	3.28	10.5	7.62
3.0	−0.38	7.0	3.89	11.0	8.14
.....	.....	7.5	4.46	11.5	8.67
3.5	+0.10	.....	.....	12.0	9.19
4.0	0.58	8.0	5.00		

Seguin

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
50	3.23	35	−0.81	21	1.98
49	3.07	34	−0.65	20	2.44
48	−2.91	33	−0.49	19	2.91
47	−2.75	32	−0.33	18	3.42
46	−2.59	31	−0.17	17	3.95
45	−2.43	30	−0.0	16	4.48
44	−2.26	29	+0.15	15	5.09
43	−2.10	28	0.31	14	5.78
42	−1.94	27	0.48	13	6.58
41	−1.78	26	0.64	12	7.36
40	−1.62	25	0.80	11	8.14
39	−1.46	24	1.07	10	8.92
38	−1.30	23	1.34	9	9.70
37	−1.14	22	1.61	8	10.48
36	−0.98				

+0.7804

TABLE 3—*Continued*

Casuist (time)					
5 year		−0.47 1 O.K.		X	
6 year		2 O.K. 3 O.K.		+0.49 0.98	
SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
300	0.99	266	1.33	232	1.67
299	1.00	265	1.34	231	1.68
298	1.01	264	1.35	230	1.69
297	1.02	263	1.36	229	1.70
296	1.03	262	1.37	228	1.71
295	1.04	261	1.38	227	1.72
294	1.05	260	1.39	226	1.73
293	1.06	259	1.40	225	1.74
292	1.07	258	1.41	224	1.75
291	1.08	257	1.42	223	1.76
290	1.09	256	1.43	222	1.77
289	1.10	255	1.44	221	1.78
288	1.11	254	1.45	220	1.79
287	1.12	253	1.46	219	1.80
286	1.13	252	1.47	218	1.81
285	1.14	251	1.48	217	1.82
284	1.15	250	1.49	216	1.83
283	1.16	249	1.50	215	1.84
282	1.17	248	1.51	214	1.85
281	1.18	247	1.52	213	1.86
280	1.19	246	1.53	212	1.87
279	1.20	245	1.54	211	1.88
278	1.21	244	1.55	210	1.89
277	1.22	243	1.56	209	1.90
276	1.23	242	1.57	208	1.91
275	1.24	241	1.58	207	1.92
274	1.25	240	1.59	206	1.93
273	1.26	239	1.60	205	1.94
272	1.27	238	1.61	204	1.95
271	1.28	237	1.62	203	1.96
270	1.29	236	1.63	202	1.97
269	1.30	235	1.64	201	1.98
268	1.31	234	1.65	200	1.99
267	1.32	233	1.66	199	2.00

TABLE 3—*Continued*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
198	2.01	157	2.42	116	2.94
197	2.02	156	2.43	115	2.96
196	2.03	155	2.44	114	2.98
195	2.04	154	2.45	113	3.00
194	2.05	153	2.46	112	3.02
193	2.06	152	2.47	111	3.04
192	2.07	151	2.48	110	3.06
191	2.08	150	2.49	109	3.08
190	2.09	149	2.50	108	3.10
189	2.10	148	2.51	107	3.12
188	2.11	147	2.52	106	3.13
187	2.12	146	2.53	105	3.15
186	2.13	145	2.54	104	3.17
185	2.14	144	2.55	103	3.19
184	2.15	143	2.56	102	3.21
183	2.16	142	2.57	101	3.23
182	2.17	141	2.58	100	3.25
181	2.18	140	2.59	99	3.27
180	2.19	139	2.60	98	3.29
179	2.20	138	2.61	97	3.31
178	2.21	137	2.62	96	3.33
177	2.22	136	2.63	95	3.35
176	2.23	135	2.64	94	3.38
175	2.24	134	2.65	93	3.41
174	2.25	133	2.66	92	3.43
173	2.26	132	2.67	91	3.46
172	2.27	131	2.68	90	3.48
171	2.28	130	2.69	89	3.51
170	2.29	129	2.70	88	3.54
169	2.30	128	2.71	87	3.56
168	2.31	127	2.73	86	3.59
167	2.32	126	2.75	85	3.62
166	2.33	125	2.77	84	3.64
165	2.34	124	2.79	83	3.67
164	2.35	123	2.81	82	3.69
163	2.36	122	2.83	81	3.72
162	2.37	121	2.85	80	3.75
161	2.28	120	2.86	79	3.77
160	2.39	119	2.88	78	3.80
159	2.40	118	2.90	77	3.83
158	2.41	117	2.92	76	3.85

TABLE 3—*Continued*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
75	3.88	53	4.88	31	6.06
74	3.90	52	4.94	30	6.11
73	3.93	51	4.99	29	6.17
72	3.96	50	5.04	28	6.22
71	4.00	49	5.10	27	6.27
70	4.05	48	5.15	26	6.33
69	4.09	47	5.20	25	6.38
68	4.13	46	5.26	24	6.43
67	4.18	45	5.31	23	6.49
66	4.22	44	5.36	22	6.54
65	4.26	43	5.42	21	6.59
64	4.31	42	5.47	20	6.65
63	4.35	41	5.52	19	6.70
62	4.40	40	5.58	18	6.75
61	4.44	39	5.63	17	6.81
60	4.51	38	5.69	16	6.86
59	4.56	37	5.74	15	6.91
58	4.62	36	5.79	14	6.97
57	4.67	35	5.85	13	7.02
56	4.72	34	5.90	12	7.07
55	4.78	33	5.95	11	7.13
54	4.83	32	6.01	10	7.18

+0.0534

Manikin and F. P.

Complete failure	−1.60
Head O.K.	−1.20
2 Reversals	−0.80
5 year 1 reversal	X
One or both arms up or out	0.40
6 year Manikin O.K.	0.80
7 year Profile O.K.	1.28
8 year Profile O.K.	1.28

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
300	2.18	294	2.21	288	2.24
299	2.18	293	2.21	287	2.24
298	2.19	292	2.22	286	2.25
297	2.19	291	2.22	285	2.25
296	2.20	290	2.23	284	2.26
295	2.20	289	2.23	283	2.26

−0.0053

TABLE 3—*Continued*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
282	2.27	241	2.47	201	2.68
281	2.27	240	2.48	200	2.68
280	2.28	239	2.48	199	2.69
279	2.28	238	2.49	198	2.69
278	2.29	237	2.49	197	2.70
277	2.29	236	2.50	196	2.70
276	2.30	235	2.50	195	2.71
275	2.30	234	2.51	194	2.71
274	2.31	233	2.51	193	2.72
273	2.31	232	2.52	192	2.72
272	2.32	231	2.52	191	2.73
271	2.32	230	2.53	190	2.73
270	2.33	229	2.53	189	2.74
269	2.33	228	2.54	188	2.74
268	2.34	227	2.54	187	2.75
267	2.34	226	2.55	186	2.76
266	2.35	225	2.55	185	2.76
265	2.35	224	2.56	184	2.77
264	2.36	223	2.56	183	2.77
263	2.36	222	2.57	182	2.78
262	2.37			181	2.78
261	2.37	221	2.57	180	2.79
260	2.38	220	2.58	179	2.79
259	2.38	219	2.58	178	2.80
258	2.39	218	2.59	177	2.80
257	2.39	217	2.59	176	2.81
256	2.40	216	2.60	175	2.81
255	2.40	215	2.60	174	2.82
254	2.41	214	2.61	173	2.82
253	2.41	213	2.61	172	2.83
252	2.42	212	2.62	171	2.83
251	2.42	211	2.62	170	2.84
250	2.43	210	2.63	169	2.85
249	2.43	209	2.63	168	2.85
248	2.44	208	2.64	167	2.86
247	2.44	207	2.64	166	2.86
246	2.45	206	2.65	165	2.87
245	2.45	205	2.65	164	2.87
244	2.46	204	2.66	163	2.88
243	2.46	203	2.66	162	2.88
242	2.47	202	2.67	161	2.89

TABLE 3—*Continued*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
160	2.89	119	3.21	78	3.82
159	2.90	118	3.22	77	3.83
158	2.90	117	3.23	76	3.85
157	2.91	116	3.24	75	3.87
156	2.91	115	3.25	74	3.88
155	2.92	114	3.26	73	3.90
154	2.93	113	3.27	72	3.92
153	2.93	112	3.27	71	3.94
152	2.94	111	3.28	70	3.95
151	2.94	110	3.29	69	3.97
150	2.95	109	3.30	68	3.99
149	2.95	108	3.31	67	4.00
148	2.96	107	3.32	66	4.02
147	2.96	106	3.34	65	4.04
146	2.97	105	3.35	64	4.06
145	2.97	104	3.37	63	4.07
144	2.98	103	3.39	62	4.09
143	2.99	102	3.41	61	4.11
142	3.00	101	3.42	60	4.12
141	3.01	100	3.44	59	4.14
140	3.02	99	3.46	58	4.16
139	3.03	98	3.47	57	4.18
138	3.03	97	3.49	56	4.19
137	3.04	96	3.51	55	4.21
136	3.05	95	3.53	54	4.23
135	3.06	94	3.54	53	4.24
134	3.07	93	3.56	52	4.26
133	3.08	92	3.58	51	4.28
132	3.09	91	3.59	50	4.29
131	3.10	90	3.61	49	4.31
130	3.11	89	3.63	48	4.33
129	3.12	88	3.64	47	4.35
128	3.13	87	3.66	46	4.36
127	3.14	86	3.68	45	4.38
126	3.15	85	3.70	44	4.40
125	3.16	84	3.71	43	4.41
124	3.16	83	3.73	42	4.43
123	3.17	82	3.75	41	4.45
122	3.18	81	3.76	40	4.47
121	3.19	80	3.78	39	4.48
120	3.20	79	3.80	38	4.50

TABLE 3—*Continued*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
175	1.48	216	1.96	256	2.43
176	1.50	217	1.97	257	2.44
177	1.51	218	1.98	258	2.45
178	1.52	219	1.99	259	2.47
179	1.53	220	2.00	260	2.48
180	1.54	221	2.02	261	2.49
181	1.55	222	2.03	262	2.50
182	1.57	223	2.04	263	2.51
183	1.58	224	2.05	264	2.52
184	1.59	225	2.06	265	2.53
185	1.60	226	2.07	266	2.54
186	1.61	227	2.09	267	2.56
187	1.62	228	2.10	268	2.57
188	1.63	229	2.11	269	2.58
189	1.65	230	2.12	270	2.59
190	1.66	231	2.13	271	2.60
191	1.67	232	2.14	272	2.61
192	1.68	233	2.16	273	2.62
193	1.69	234	2.17	274	2.63
194	1.70	235	2.18	275	2.65
195	1.71	236	2.19	276	2.66
196	1.73	237	2.20	277	2.67
197	1.74	238	2.21	278	2.68
198	1.75	239	2.23	279	2.69
199	1.76	240	2.24	280	2.70
200	1.77	241	2.25	281	2.71
201	1.78	242	2.26	282	2.73
202	1.80	243	2.27	283	2.74
203	1.81	244	2.28	284	2.75
204	1.82	245	2.29	285	2.76
205	1.83	246	2.31	286	2.77
206	1.84	247	2.32	287	2.78
207	1.85	248	2.33	288	2.79
208	1.87	249	2.34	289	2.80
209	1.88	250	2.35	290	2.82
210	1.89	251	2.36	291	2.83
211	1.90	252	2.38	292	2.84
212	1.91	253	2.39	293	2.85
213	1.92	254	2.41	294	2.86
214	1.94	.....	.....	295	2.87
215	1.95	255	2.42	296	2.88

0.0116

TABLE 3—*Continued*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
297	2.89	337	3.35	378	3.82
298	2.91	338	3.37	379	3.83
299	2.92	339	3.38	380	3.84
300	2.93	340	3.39	381	3.85
301	2.94	341	3.40	382	3.86
302	2.95	342	3.41	383	3.87
303	2.96	343	3.42	384	3.89
304	2.97	344	3.43	385	3.90
305	2.99	345	3.44	386	3.91
306	3.00	346	3.46	387	3.92
307	3.01	347	3.47	388	3.93
308	3.02	348	3.48	389	3.94
309	3.03	349	3.49	390	3.95
310	3.04	350	3.50	391	3.96
311	3.05	351	3.51	392	3.98
312	3.06	352	3.52	393	3.99
313	3.08	353	3.53	394	4.00
314	3.09	354	3.55	395	4.01
315	3.10	355	3.56	396	4.02
316	3.11	356	3.57	397	4.03
317	3.12	357	3.58	398	4.04
318	3.13	358	3.59	399	4.05
319	3.14	359	3.60	400	4.07
320	3.15	360	3.61	401	4.08
321	3.17	361	3.63	402	4.09
322	3.18	362	3.64	403	4.10
323	3.19	363	3.65	404	4.11
324	3.20	364	3.66	405	4.12
325	3.21	365	3.67	406	4.13
326	3.22	366	3.68	407	4.14
327	3.23	367	3.69	408	4.16
328	3.24	368	3.70	409	4.17
329	3.26	369	3.72	410	4.18
330	3.27	370	3.73	411	4.19
331	3.28	371	3.74	412	4.20
332	3.29	372	3.75	413	4.22
333	3.30	373	3.76	.....	.....
.....	.....	374	3.77	414	4.23
334	3.32	375	3.78	415	4.24
335	3.33	376	3.79	416	4.26
336	3.34	377	3.81	417	4.27

0.0113

0.0113

TABLE 3—*Continued*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
418	4.28	459	4.79	500	5.30
419	4.29	460	4.80	501	5.31
420	4.31	461	4.82	502	5.32
421	4.32	462	4.83	503	5.34
422	4.33	463	4.84	504	5.35
423	4.34	464	4.85	505	5.36
424	4.36	465	4.86	.....	.....
425	4.37	466	4.88	506	5.38
426	4.38	467	4.89	507	5.39
427	4.39	468	4.90	508	5.41
428	4.41	469	4.91	509	5.42
429	4.42	470	4.93	510	5.44
430	4.43	471	4.94	511	5.45
431	4.44	472	4.95	512	5.47
432	4.46	473	4.96	513	5.48
433	4.47	474	4.98	514	5.50
434	4.48	475	4.99	515	5.51
435	4.49	476	5.00	516	5.53 0.0153
436	4.51	477	5.01	517	5.54
437	4.52	478	5.03	518	5.56
438	4.53	479	5.04	519	5.57
439	4.54	480	5.05	520	5.59
440	4.55	481	5.06 0.0124	521	5.60
441	4.57	482	5.08	522	5.62
442	4.58	483	5.09	.....	.....
443	4.59	484	5.10	523	5.64
444	4.60	485	5.11	524	5.66
445	4.62	486	5.13	525	5.67
446	4.63	487	5.14	526	5.69 0.0166
447	4.64	488	5.15	527	5.71
448	4.65	489	5.16	528	5.72
449	4.67	490	5.17	529	5.74
450	4.68	491	5.19	530	5.76
451	4.69	492	5.20	531	5.77
452	4.70	493	5.21	532	5.79
453	4.72	494	5.22	533	5.81
454	4.73	495	5.24	534	5.82
455	4.74	496	5.25	535	5.84
456	4.75	497	5.26	536	5.86
457	4.77	498	5.27	537	5.87
458	4.78	499	5.29	538	5.89

TABLE 3—*Continued*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
37	4.52	31	4.62	25	4.72
36	4.53	30	4.64	24	4.74
35	4.55	29	4.65	23	4.76
34	4.57	28	4.67	22	4.77
33	4.59	27	4.69	21	4.79
32	4.60	26	4.71	20	4.81

+0.0171

Mare and foal

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
150	−1.33	120	−0.59	91	0.13
149	−1.31	119	−0.56	90	0.16
148	−1.28	118	−0.54	89	0.18
147	−1.26	117	−0.51	88	0.21
146	−1.23	116	−0.49	87	0.23
145	−1.21	115	−0.46	86	0.26
144	−1.18	114	−0.44	85	0.28
143	−1.16	113	−0.41	84	0.31
142	−1.13	112	−0.39	83	0.33
141	−1.11	111	−0.36	82	0.35
140	−1.08	110	−0.34	81	0.38
139	−1.06	109	−0.32	80	0.40
138	−1.03	108	−0.29	79	0.43
137	−1.01	107	−0.27	78	0.45
136	−0.98	106	−0.24	77	0.48
135	−0.96	105	−0.22	76	0.50
134	−0.93	104	−0.19	75	0.53
133	−0.91	103	−0.17	74	0.55
132	−0.89	102	−0.14	73	0.58
131	−0.86	101	−0.12	72	0.60
130	−0.84	100	−0.09	71	0.63
129	−0.81	99	−0.07	70	0.66
128	−0.79	98	−0.04	69	0.70
127	0.76	97	−0.02	68	0.74
126	−0.74	.....	.....	67	0.78
125	−0.71	96	+0.01	66	0.82
124	−0.69	95	0.03	65	0.86
123	−0.66	94	0.06	64	0.91
122	−0.64	93	0.08	63	0.95
121	−0.61	92	0.11	62	0.99

−0.0248

TABLE 3—*Continued*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
61	1.03	43	2.05	26	4.27
60	1.07	42	2.14	25	4.49
59	1.11	41	2.24	24	4.71
58	1.15	40	2.33	23	4.97
57	1.19	39	2.44	22	5.23
56	1.23	38	2.55	21	5.49
55	1.27	37	2.66	20	5.74
54	1.31	36	2.77	19	6.01
53	1.36	35	2.88	18	6.27
52	1.40	34	2.99	17	6.52
51	1.44	33	3.13	16	6.78
50	1.48	32	3.27	15	7.04
49	1.52	31	3.42	14	7.30
48	1.58	30	3.56	13	7.56
47	1.68	29	3.71	12	7.82
46	1.77	28	3.85	11	8.08
45	1.86	27	4.06	10	8.34
44	1.96				

+0.257

Healy I

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
0	−1.10	18	−0.83	36	−0.56
1	−1.09	19	−0.82	37	−0.55
2	−1.08	20	−0.80	38	−0.53
3	−1.06	21	−0.79	39	−0.52
4	−1.04	22	−0.77	40	−0.50
5	−1.03	23	−0.76	41	−0.49
6	−1.01	24	−0.74	42	−0.47
7	−1.00	25	−0.73	43	−0.46
8	−0.98	26	−0.71	44	−0.44
9	−0.97	27	−0.70	45	−0.43
10	−0.95	28	−0.68	46	−0.41
11	−0.94	29	−0.67	47	−0.40
12	−0.92	30	−0.65	48	−0.38
13	−0.91	31	−0.64	49	−0.37
14	−0.89	32	−0.62	50	−0.35
15	−0.88	33	−0.61	51	−0.34
16	−0.86	34	−0.59	52	−0.32
17	−0.84	35	−0.58	53	−0.31

TABLE 3—*Continued*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
54	−0.29	94	0.31	135	0.93
55	−0.28	95	0.33	136	0.95
56	−0.26	96	0.34	137	0.96
57	−0.24	97	0.36	138	0.98
58	−0.23	98	0.37	139	0.99
59	−0.21	99	0.39	140	1.01
60	−0.20	100	0.40	141	1.02
61	−0.18	101	0.42	142	1.04
62	−0.17	102	0.43	143	1.05
63	−0.15	103	0.45	144	1.07
64	−0.14	104	0.46	145	1.08
65	−0.12	105	0.48	146	1.10
66	−0.11	106	0.50	147	1.11
67	−0.09	107	0.51	148	1.13
68	−0.08	108	0.53	149	1.14
69	−0.06	109	0.54	150	1.16
70	−0.05	110	0.56	151	1.17
71	−0.03	111	0.57	152	1.19
72	−0.02	112	0.59	153	1.20
73	−0.00	113	0.60	154	1.22
.....	.....	114	0.62	155	1.23
74	+0.00	115	0.63	156	1.25
75	0.03	116	0.65	157	1.27
76	0.04	117	0.66	158	1.28
77	0.06	118	0.68	159	1.30
78	0.07	119	0.69	.....	.....
79	0.09	120	0.71	160	1.31
80	0.10	121	0.72	161	1.32
81	0.12	122	0.74	162	1.33
82	0.13	123	0.75	163	1.34
83	0.15	124	0.77	164	1.36
84	0.16	125	0.78	165	1.37
85	0.18	126	0.80	166	1.38
86	0.19	127	0.81	167	1.39
87	0.21	128	0.83	168	1.40
88	0.22	129	0.84	169	1.41
89	0.24	130	0.86	170	1.43
90	0.25	131	0.87	171	1.44
91	0.27	132	0.89	172	1.45
92	0.28	133	0.90	173	1.46
93	0.30	134	0.92	174	1.47

0.0151

TABLE 3—*Continued*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
539	5.91	575	6.50	611	7.10
540	5.92	576	6.52	612	7.12
541	5.94	577	6.54	613	7.13
542	5.96	578	6.55	614	7.15
543	5.97	579	6.57	615	7.17
544	5.99	580	6.59	616	7.18
545	6.01	581	6.60	617	7.20
546	6.02	582	6.62	618	7.22
547	6.04	583	6.64	619	7.23
548	6.06	584	6.65	620	7.25
549	6.07	585	6.67	621	7.27
550	6.09	586	6.69	622	7.28
551	6.10	587	6.70	623	7.30
552	6.12	588	6.72	624	7.32
553	6.14	589	6.74	625	7.33
554	6.15	590	6.75	626	7.35
555	6.17	591	6.77	627	7.37
556	6.19	592	6.79	628	7.38
557	6.20	593	6.80	629	7.40
558	6.22	594	6.82	630	7.42
559	6.24	595	6.84	631	7.43
560	6.25	596	6.85	632	7.45
561	6.27	597	6.87	633	7.47
.....	.....	598	6.89	634	7.48
562	6.28	599	6.90	635	7.50
563	6.30	600	6.92	636	7.52
564	6.32	601	6.93	637	7.53
565	6.34	602	6.95	638	7.55
566	6.35	603	6.97	639	7.57
567	6.37	604	6.98	640	7.58
568	6.39	605	7.00	641	7.60
568	6.40	606	7.02	642	7.62
570	6.42	607	7.03	643	7.63
571	6.44	608	7.05	644	7.65
572	6.45	609	7.07	645	7.67
573	6.47	610	7.08	646	7.68
574	6.49				

0.0166

TABLE 3—*Continued*

Maze

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
4.0	−2.01	8.0	1.59	13.5	5.17
4.5	−1.54	8.5	1.99	14.0	5.48
5.0	−1.08	9.0	2.39	14.5	5.79
5.5	−0.61	9.5	2.74	15.0	6.10
6.0	−0.14	10.0	3.05	15.5	6.42
.....	.....	10.5	3.36	16.0	6.73
6.5	+0.33	11.0	3.67	16.5	7.04
7.0	0.80	11.5	3.98	17.0	7.35
		12.0	4.29	17.5	7.67
		12.5	4.57	18.0	7.98
7.5	1.20	13.0	4.85		

Kohs Block Design

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
0	−0.38	23	3.02	47	4.49
1	−0.13	24	3.10	48	4.54
.....	.....	25	3.17	49	4.60
2	+0.12	26	3.24	50	4.65
3	0.37	27	3.32	51	4.70
4	0.62	28	3.39	52	4.76
5	0.86	29	3.47	53	4.81
6	0.99	30	3.54	54	4.86
7	1.12	31	3.61	55	4.92
8	1.25	32	3.69	56	4.97
9	1.38	33	3.74	57	5.01
10	1.51	34	3.80	58	5.06
11	1.64	35	3.85	59	5.10
12	1.77	36	3.90	60	5.15
13	1.90	37	3.96	61	5.19
14	2.03	38	4.01	62	5.24
15	2.16	39	4.06	63	5.28
16	2.29	40	4.12	64	5.33
17	2.42	41	4.17	65	5.38
18	2.55	42	4.22	66	5.42
19	2.68	43	4.28	67	5.47
20	2.80	44	4.33	68	5.51
21	2.87	45	4.38	69	5.56
22	2.95	46	4.44	70	5.60

TABLE 3—*Concluded*

SCORE	POINTS	SCORE	POINTS	SCORE	POINTS
71	5.65	92	6.60	113	7.54
72	5.69	93	6.64	114	7.59
73	5.74	94	6.69	115	7.63
74	5.78	95	6.73	116	7.67
75	5.83	96	6.78	117	7.72
76	5.88	97	6.82	118	7.76
77	5.92	98	6.87	119	7.81
78	5.97	99	6.91	120	7.85
79	6.01	100	6.96	121	7.90
80	6.06	101	7.00	122	7.94
81	6.11	102	7.05	123	7.99
82	6.15	103	7.09	124	8.03
83	6.20	104	7.14	125	8.08
84	6.24	105	7.18	126	8.12
85	6.28	106	7.23	127	8.17
86	6.33	107	7.27	128	8.21
87	6.37	108	7.32	129	8.26
88	6.42	109	7.36	130	8.30
89	6.46	110	7.41	131	8.35
90	6.51	111	7.45	132	8.39
91	6.55	112	7.50	133	8.44

Nygaard's (7) formula based on averages. For 76 cases for which Kuhlmann-Binet IQ's and performance scale IQ's were available, the probable error of measurement was 4.95.[2]

Tentative mental age norms, based upon the scores of about three hundred subjects indicate that the Binet revisions have been standardized against a somewhat brighter population than that employed in the present work. We had felt that our standards were probably too high because of the lack, in the occupational distribution, of a large enough proportion of unskilled labor. The difference in the crude score norms between the standardization against chronological age and

[2] To Miss Margaret Weikert, of the Ramsey County Children's (Tuberculosis) Preventorium we are indebted for the use of about 100 subjects for whom Binet ratings had already been obtained by the writer.

that against Binet mental age will probably prove to be less important in raising the correlation with the Binet ratings than the change in the calibration of the scale. The Seguin Form Board and the Porteus Maze obtain a much lighter weighting, while Healy Picture Completion I, and Kohs Block Design are weighted heavily.

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EUGENIC STERILIZATION IN CALIFORNIA

XII. Social and Economic Status of the Sterilized Feebleminded

PAUL POPENOE

Pasadena, California

As part of the study of the consequences of eugenic sterilization in California, which has been under way for more than two years, financed and directed by E. S. Gosney of Pasadena[1] in consultation with an advisory committee made up of recognized authorities in many lines, an examination was made of the records of the Sonoma State Home for the Feebleminded (Eldridge, Sonoma County, California) to ascertain the social and economic status of the families whose children have been sterilized there.

It is hardly necessary to point out that these families are not representative of all the families which are producing defective children in the state. In the first place, the well-to-do family may keep its defective child at home or place in it a private institution. In the second place, Sonoma gets more than a fair share of the delinquent feebleminded, and of those who come from broken families or have been supported by charity, together with other special groups such as illegitimate children and foundlings. The quiet, well-behaved, but retarded child is rarely sent to an institution, for he fits into the community acceptably.

OCCUPATIONS OF FATHERS

In five-sixths of our total of 605 cases the occupation of the child's father was stated in the history. These were classified

[1] A list of the other papers in this series will be sent on application to E. S. Gosney, 26 N. Marengo Avenue, Pasadena, Calif.

according to the grouping made familiar by F. W. Taussig, and are shown in table 1. With them are shown, in similar grouping, the fathers of 560 of the brightest children in the public

TABLE 1

Percentage distribution of occupational status of males

	1	2	3	4	5	6
	FATHERS OF CALIFORNIA GIFTED CHILDREN*	FATHERS OF 300 GREAT GENIUSES†	FATHERS OF MUNICH SUBJECTS‡	FATHERS OF SONOMA PATIENTS	ALL ADULT MALES IN CALIFORNIA 1920	EXCESS (+) OR DEFICIENCY (−) OF COLUMN 4 COMPARED WITH COLUMN 5
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
Professional class.....	31	52	1	1	4	−3
Semi-professional and business: a. higher group.....	31	29	1	2	4	−2
b. Lower group.....	18	14	20	10	19	−9
Skilled labor.....	12		43	45	47	−2
Semi-skilled to slightly skilled.....	7	4	18	18	18	0
Common labor.....	1	1	17	24	8	+16
	100	100	100	100	100	
Total number in group.....	560	300	683	485	1,226,113	

* Terman, L. M. Genetic Studies of Genius, Vol. I. Mental and Physical Traits of 1000 Gifted Children. Stanford University, 1925.

† Genetic Studies of Genius, Vol. II. Early Mental Traits of 300 Geniuses. By Catherine M. Cox. Stanford University, 1927. In this column the nobility are included in the professional class, the gentry with the semi-professional. Dr. Cox lumps the lower business and skilled labor together in a single group, and we have not attempted to divide it to make it correspond to the other groupings.

‡ Prokein, F. "Ueber die Eltern der schwachsinnigen Hilfsschulkinder Muenchens und ihre Fortpflanzung." Archiv f. Rassen-und-Gesellschaftsbiologie 17 (4): 360–370, 1926.

schools of California; the fathers of 300 of the world's greatest geniuses; the fathers of 683 mentally defective children in special schools of Munich, Germany, and finally, the whole

adult male population of the state of California (based on the 1920 census).

In comparison with the group last-named, it is clear that the higher economic groups in the population are under-represented among the Sonoma fathers, the professional class having only one-fourth of its quota; and that the lowest group, made up of unskilled laborers, has three times its quota. This is partly due to the presence of certain stocks, such as the Mexicans, who are found preponderantly among the common laborers. Still, the distribution of the Sonoma fathers is much more nearly representative than many would have expected.

TABLE 2

Percentage distribution of Barr ratings

RATING	FATHERS OF PATIENTS STERILIZED AT SONOMA	FATHERS OF THE MOST SUPERIOR CHILDREN	TOTAL MALE POPULATION OF CALIFORNIA
0–1.9	0.62	0.00	6.05
2–3.9	23.71	0.02	20.23
4–5.9	20.00	1.14	17.64
6–7.9	17.11	5.53	26.07
8–9.9	28.05	9.12	20.20
10–11.9	8.66	30.47	6.11
12+	1.85	53.72	3.70
	100.00	100.00	100.00
Mean.....	6.64±08	12.77 ±08	8.38 ±00
N.....	485	525	1,226,113

Since one-sixth of the Sonoma fathers had to be omitted from the tabulation because nothing was said about them, it might be supposed that this one-sixth was made up largely of the lower strata of the population. The supposition seems to be untenable, because approximately the same distribution is found among the fathers of feebleminded school children in Munich, Germany.

The differences between these groups and those fathers who have produced brilliant children are too obvious to need emphasis. It is clear that both in California and in Germany,

the parentage of defective children is markedly different from the parentage of brilliant children. The sterilization of these feebleminded may deprive civilization of some future "average citizens," but it can scarcely reduce the number of future geniuses.

The question may be examined in more detail and probably with greater accuracy, by giving the father's occupation a numerical value, in accordance with F. E. Barr's rating scale.[3] Table 2 shows the percentage distribution of these ratings. For a comparison, first the ratings of the fathers of the most superior school children are recorded; secondly the ratings of the entire adult male population of the state, based on the 1920 census.

A glance at the table shows that the fathers of the sterilized feebleminded are not a bad sample of the population as a whole. At least, they do not deviate in any distinctive way. The lowest grade, made up largely of hoboes and odd job men, is under-represented at Sonoma, perhaps because such individuals are less frequently fathers. The other groups show the kind of deviations that would be expected as a matter of chance. The preponderance of fathers in grades 8 to 10, representing the skilled trades, is worth mention. It is this level of the population, and not the defectives, that furnishes the largest number of children to the Sonoma state home, in so far as our own records permit an accurate judgment. The fact stands out prominently, that the institution is not kept filled by the progeny of the down-and-outers, the poorhouse group, or even the unskilled laborers. It represents all grades of the population.

Popular opinion would probably expect to find a larger relative representation of the lower grades, among whom lower levels of average intelligence undoubtedly predominate. The

[3] This is an attempt to construct a hierarchy of the occupations with respect to the relative demands they make upon intelligence. A list of 100 occupations was rated by 30 judges and probable error values were computed from their ratings. The work, which represents a master's thesis at Stanford University, was published by L. M. Terman in *Genetic Studies of Genius*, i: 67–69, 1925.

primary reason why the prosperous, efficient class of skilled laborers sends the largest number of children to Sonoma (and also furnishes the largest group of defectives in the Munich Schools) is that this class is the largest in the entire population, making up nearly one-half of the total on Professor Taussig's distribution. It may also be more interested in sending its defectives to an institution, where they will receive proper care, than is the shiftless, defective family in which the parents are not themselves much above the level of institutional admission.

The actual situation calls attention strikingly to the fact that there is only a moderate correlation (about 0.40 at most, and much lower than this, down nearly to 0, in many studies)[3] between abstract intelligence, of the sort which figures largely in the IQ, and mechanical ability. A man may be successful in his trade—not a leader in the industry, but a steady, prosperous workman—with a less than mediocre mental endownment in terms of the IQ. On the other hand, the professional class excels in the type of intelligence which the IQ measures. By the action of natural and social selection and assortative mating, a professional class is therefore produced, in which the level of abstract intelligence is definitely set off from that of the larger and perhaps financially more prosperous skilled trades, in which the greater frequency of low IQ's is not such a handicap.[4]

[3] Stenquist, J. L. Measurements of Mechanical Ability. Teachers College, N. Y., 1923 (r = 0. 40). Karl M. Cowdery (Measures of general intelligence as indices of success in trade learning, Jour. Appl. Psychol., vi: 311–330, December, 1922) showed that most of the correlations with IQ, in a group of delinquent boys at the Whittier (Calif.) State School were negligible; many of them were negative. More generally, Maud A. Merrill (The relation of mental age to industrial efficiency of a group of mental defectives. Jour. Delinquency, ix: 83–104, January–March, 1925) showed that the correlation is positive up to a mental age of about 8, 0 above that age.

[4] V. Moorrees (The immediate hereditary of primary aments committed to a public institution, Jour. Appl. Psychol., viii: 89–127, March, 1924) who found similar conditions in a small study from the New York City Children's Hospital, was able to test the fathers of 45 of the patients, and found that they were below the Army standard of intelligence for their occupations.

The fact seems to be that the mental defectives *do* come from all classes of the community; and that the bulk of them come from the "middle classes," not from the slums. This can hardly be explained by differences in relative fecundity since the parents of Sonoma children have been found in our study not to be above the average of the California population in the number of children reared.

CONTRIBUTION OF THE PROFESSIONAL CLASSES

Comparison with the parentage of the bright school children shows that these come principally from the professional classes, which, as mentioned above, represent a strong concentration of the kind of talents that make for high standing in the current tests of "general intelligence." These classes are almost absent in the Sonoma figures; indeed, 84 per cent of the brilliant children have fathers in classes containing only 10 per cent of those at Sonoma. While the population of the state as a whole is fairly well represented among the sterilized feebleminded, the thin intellectual stratum at the top is not.

One might suspect that this is because the intellectual stratum takes care of its own feebleminded elsewhere. L. M. Terman inquired particularly on this point, in making up the family histories of the 1000 brightest children. While these histories might not be wholly accurate, because of deliberate concealment of facts or for other reasons, they appear to be notably so, and are certainly more complete than those of the Sonoma families.

Only 15 cases of feeblemindedness were reported among all the relatives of the 1000 children, of whom anything could be learned. None of these cases was in a parent, grandparent, or great-grandparent. A third of all the cases were in a single family, in which a child had four uncles and a cousin, in the paternal line, who were mentally deficient. One child had a feebleminded brother. The other cases were more remote.

While the data do not permit of a minute comparison, point by point, the general result, and still more a casual reading of

the family histories, shows that the groups are widely differentiated, in respect to the prevalence of mental defect.

It has always been a disputed question to what extent such defect may be expected in various strata of the population. While our figures do not give a general answer on this point, a conservative interpretation of them suggests that the type of feebleminded now receiving custodial care is greatly scattered; that it is more common than might be expected in some of the higher strata, such as those which yield the personnel of the skilled trades; and that it is much less common in the highest intellectual stratum, containing chiefly the professional class, which furnishes most of the very bright children to the public schools.

CORRELATIONS WITH FAMILY HISTORIES

A parallel inquiry may be made by correlating the IQ of the sterilized patient with the Barr rating of the father. There turns out to be no association at all ($r = 0.02$). Within the range of cases here represented, the dullest patient is just as likely to come from the family of highest standing; the brightest patient from the family of the casual laborer.

It might be thought that this lack of correlation is due to the mixture of cases from two types of family. Some would represent the sporadic appearance of defect in a superior family; others would be individuals from inferior families in which the members who did not get into Sonoma might be just about like those who did. The family histories were therefore divided into two groups. If there were no known case of mental defect or disease except the patient, the history was called negative; if there were other cases in the ancestry, it was called positive. The positive family histories, numbering 275, were then dealt with separately, but the correlation between IQ and father's Barr rating was again zero, or more precisely, 0.06 ± 0.04. It must be concluded, then, so far as the patients sterilized at Sonoma are concerned, that even in the families in which feeblemindedness is hereditary, there is no association between the child's level of intelligence, and the father's level of occupation.

This is of course due largely to the fact that mental defect is usually produced by recessive genes;[5] and it also points to the fact that a number of different genes are involved in the production of the level of intelligence.

When the positive and negative families were separated, the father of higher intellectual status (as measured by the Barr rating) was found about as often in the one as in the other, the correlation between the rating and the type of family history being only 0.14 ± 0.04, which is so small as to be almost negligible for the purpose of prediction in individual cases.

This again emphasizes the large extent to which strains producing mental defect are scattered throughout the entire population—with the exception, as has previously been mentioned, of the superior intellectual stratum at the top. The widespread distribution of the recessive genes producing mental defect is no novelty to geneticists, who have long been calling attention to it. It seems likely that assortative mating may be playing a part here. In the most intelligent part of the population, the intellect of a girl and of her family may carry more weight with the prospective suitor; and vice versa. The intensity of assortative mating may diminish as one descends in the occupational scale; partly because of less range of choice, partly because of less highly educated tastes and standards. Karl Pearson found this to be the situation when assortative mating was studied in England, with reference to some other traits. In the United States, the tendency for college men and

[5] The most probable *a priori* genetic assumption, that the level of intellect is normally produced by a multiplicity of genes without dominance, seems to be confirmed by the experimental work of Harold Ellis Jones (27th Yearbook of Nat. Soc. for the Study of Education, V., A first study of parent-child resemblance in intelligence). It is also probable *a priori*, however, that many cases of mental defect are due to the interference of recessive genes with normal development; and our own study (not yet published) of the pedigrees of patients at the Sonoma State Home supports this view. An occasional pedigree is also found in which the defect seems to be dominant—a condition also to be expected in the light of modern genetics, which has shown that the same end-product is reached by a variety of different modes of inheritance.

college women to marry each other is familiar. On the other hand, we have studied the marriages of sterilized female patients at Sonoma (to be reported more fully in another paper), and found no correlation whatever between the IQ of the girl, and the Barr rating of her husband ($r = 0.08$). Between the Barr ratings of the girl's husband and of her father there was a moderate correlation (0.34 ± 0.08) showing the tendency of people to marry in their own class. The whole question deserves extensive study. If it is a fact that in a large part of the population, a husband or wife is picked out without much relation to intelligence, but because of temperamental and physical qualities, then it is not surprising that this part of the population is honeycombed with the recessive genes of mental deficiency.

With the material used in the present paper, it was not possible to throw much light on this point. The father's Barr rating was correlated with the mother's occupation, on the assumption that the latter would be some indicator of the mother's level of intelligence, and a correlation ratio (Eta) of 0.46 ± 0.04 was found. This agrees surprisingly well with the coefficient of assortative mating for intelligence, which several recent studies[6] have shown to be from 0.40 to 0.60. But the data in this case permit only of such an indirect approach (not to mention the statistical deficiencies of Eta itself) that little weight can be attached to the figure for the present purpose, save to note that it does not at all bear out the speculations presented in the preceding paragraph.

There is a more significant association between Barr rating and religion, the mean of the Protestants being 7.54 ± 0.13 and that of the Catholics 5.78 ± 0.12. Bi-serial r between

[6] For instance, those of Barbara Burks Ramsperger in the 27th Yearbook of the National Society for the Study of Education, 1928, and of R. R. Willoughby (Family Similarities in Mental Test Abilities, Genetic Psychol. Monogs, II, No. 4, July, 1927). If corrected for attenuation, the coefficients may be raised to 0.70 or more. It is worth noting that this is an extremely high coefficient of assortative mating, the resemblance in physical traits being generally of the order of 0.25, and that for temperamental traits apparently being negative.

Barr rating and Protestantism is 0.37 ± 0.03. A large part of the Roman Catholics represented in these histories are Mexicans, Portugese, or Italians; the two first-named, in particular, are engaged predominantly in the less skilled types of occupation. But little or no direct association was found between foreign birth, as such, and the Barr rating.[7]

OCCUPATIONS OF MOTHERS OF STERILIZED FEEBLEMINDED

The mother's occupations are not so easily dealt with, for most of them are returned as home makers, a description which

TABLE 3

Occupations of mothers and IQ's of 605 patients sterilized at Sonoma State Home

I.Q.	HOME-MAKER	DOMESTIC SERVANT	LAUNDRY	TRADE	OFFICE WORK	NURSING	TEACHER	SEAM-STRESS	PROSTI-TUTE	MISCELLA-NEOUS	NOT STATED	TOTAL
30/39	19	5		3							8	35
40/49	49	18	1	3	2			3		2	15	93
50/59	86	21	7	8	1	1	3	1	1	1	36	166
60/69	88	20	4	9		2		1	2		39	165
70/79	55	4	2	5		1	1	3	2	2	15	90
80/89	15	3	1	5	2	1	1		1		17	46
90/99	7	2				1						10
Total	319	73	15	33	5	6	5	8	6	5	140	605

tells next to nothing about the real capacity of the individual. Table 3 is the correlation surface, showing the relation between patient's IQ and occupation of mother. The correlation ratio, Eta, calculated from this is 0.14 ±0.03, a little larger than the product-moment coefficient found between occupation of father and IQ of offspring, but again indicating only a very slight association, if any; though so far as it goes it agrees with the

[7] Because of space limitations, details on this point, and many tables of data, are omitted from this publication. A copy of any of them will be sent to any qualified student on application to E. S. Gosney, in whose office all the original material is also accessible for examination.

finding[8] that the IQ of offspring is correlated a little more closely with IQ of mother than with that of father.

Analysis of the occupations of the patients themselves, prior to commitment, seemed profitless, since most of them had no regular work or at the most had done odd jobs and unskilled labor. Their occupations on parole were discussed in the third paper of this series.[9]

CONCLUSIONS

This brief examination of the social and economic status of the parents of the sterilized feebleminded seems strongly to support the principle that sterilization must be applied to individuals because of their individual characteristics and inheritance, rather than because of their inclusion in some particular socio-economic group. It has been shown that little or nothing can be inferred regarding the parentage of a deficient individual, from his presence in the Sonoma State Home. "The lowest" individual is about as likely to be the offspring of a highly paid, skilled mechanic or a small business man, as of a dishwasher or chronic loafer.

To sterilize an individual merely because he belongs to a certain social or economic stratum of society,—because he is a pauper or "socially inadequate,"—finds no support whatever in this study.

Sterilization is, then, indicated as a measure to be applied to definite individuals. And these individuals must be selected because of their own personal and ancestral peculiarities, not because their family falls in some particular occupational group of the population.

SUMMARY

1. In socio-economic status, the fathers of 485 feebleminded individuals sterilized in California rank about the same as do

[8] Jones, Harold Ellis, *ubi supra*.

[9] Popenoe, Paul. Eugenic Sterilization in California. 3. Success of the Feebleminded on parole after sterilization. Proc. 41st ann. session of the American Assn. for the Study of the Feebleminded, 1927, pp. 86–103.

those of 725 mentally deficient children in the schools of Munich, Germany.

2. Both groups are markedly differentiated in such status from the parents of the brightest California school children, still more from the parents of the world's greatest geniuses.

3. The parents of the sterilized patients are distributed (within certain limits) about the same as the whole adult male population of the State of California.

4. Apparently the greatest number of institutional feeble-minded are the children of skilled laborers, not of paupers or of the casual labor class. The same is true of the retarded school children of Munich. This is primarily because skilled labor makes up the largest single element (nearly one-half) of the population. It also points to the fact that mechanical ability and abstract intelligence in the father do not necessarily go together in high degree; further to the possibility of a lessened assortative mating for intelligence in this part of the population.

5. While the parentage of the sterilized patients is fairly representative of California as a whole, the small intellectual stratum, which produces most of the bright children in the public schools, furnishes much less than its quota of mental deficiency.

6. There is no association whatever between the child's mental level and the father's occupational level, in the group studied.

7. There is little or no relation between the father's status, and the presence or absence of other cases of mental defect and disease among his relatives, in this group.

8. There is little or no relation between place of birth (United States or foreign) and the father's status. There is a significant association between this status and the father's religion.

9. There is little or no association between the intelligence of the sterilized patient and the mother's occupational level.

10. There is a marked similarity of occupational status between husband and wife (assortative mating).

11. Since the type of feeblemindedness requiring institutional

care is found to be so widely distributed throughout the whole population, this study supports the view that the selection of any socio-economic level for sterilization is not an adequate or a scientific procedure. Sterilization must be applied on the merits of each individual case.

THE MEASUREMENT OF SOCIAL INTELLIGENCE[1]

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Since the general impetus given to psychological test construction some fifteen or twenty years ago, there have been many intelligence tests in the field. Most of these have aimed at obtaining a measure of that quality which is variously called general intelligence, abstract intelligence, or mental alertness, all of which mean the ability to deal with ideas.

It has come to be recognized, as Thorndike pointed out, that intelligence is not only of the abstract variety, but may be distinctly of the mechanical variety, or the social variety. Experience in studying the bases for success of college students, and the bases for success in various vocations, has emphasized the importance of this last variety, and has led to study of means of measuring social intelligence. There is unquestionably great need for a reliable device that will give some indication of this side of a person's ability. Numerous examples of brilliant students who fail in the vocational world, or persons of mediocre mental ability who make "shining successes" in human engineering point to the need.

The George Washington University Social Intelligence Test, developed in the Psychology Department of the University, is designed to measure social intelligence defined as ability to deal with people. The separate parts of this test are based on a careful consideration and study of the factors entering into ability to get along with others. Six parts measuring different factors in social intelligence are included

[1] This study was made in the Department of Psychology of George Washington University. Credit is due Professor F. A. Moss, Head of the Department, for guidance in the study.

in the test. 1. Judgment in Social Situations, in which the individual taking the test is presented problems in social relationships, and for each, four suggested solutions from which he must choose one. 2. Memory for Names and Faces, in which a dozen faces and names presented at the beginning of the test must be identified later in a larger group. 3. Recognition of Mental States from Facial Expression, in which the mental states must be recognized from the expressions as portrayed in pictures. 4. Observation of Human Behavior in the form of a true-false test. 5. Social Information in the form of a true-false test. 6. Recognition of the Mental States Behind Words in which the individual taking the test must recognize the mental states behind various quotations from literature and current speech.

TABLE 1

	PART 1	PART 2	PART 3	PART 4	PART 5	PART 6
Part 1		0.23	0.34	0.41	0.17	0.42
Part 2			0.30	0.24	0.18	0.17
Part 3				0.34	0.35	0.41
Part 4					0.35	0.44
Part 5						0.33

The six parts all show intercorrelations below 0.45. In only four cases does one of the parts correlate with another part to the extent of over 0.35. Part 2, or the test of Memory for Names and Faces, has the lowest average intercorrelation with other parts, indicating that the ability measured by this test is the most distinctive of the six factors included, or the least measured also by any of the others.

The intercorrelations based on the scores of 243 college students are given in table 1.

ANALYSIS OF THE SEPARATE PARTS

Some interesting facts have been brought out by analysis of the six factors included in the test.

In regard to *Ability to Remember Names and Faces*, the com-

mon opinion is that people remember faces much better than names. It seems that some of the supposed superiority in this respect is to be attributed to the fact that a pretense of remembering faces is not so easily discovered as a pretense of remembering names. In testing a group of fifty persons with ten faces and ten names to be recognized among forty-eight faces and forty-eight names, it was found that 60 per cent remembered more faces than names and about one-fifth remembered more names than faces.

General ability to remember names and faces is high among business men. Employees in administrative and executive positions score higher on the test than the majority of college students. Groups of teachers who have taken the test also show high averages. In general, the tests have shown that those successfully performing tasks which require above average ability to remember people score relatively high on the test.

The relation of ability to remember names and faces to other abilities is perhaps significant. Such ability is not closely related to academic training or education. Almost 40 per cent of high school students do as well as the average college student. Also, ability to remember names and faces shows less relation to abstract intelligence than do other contributors to social intelligence. Abstract intelligence does contribute to a considerable extent to total ability to get along with others, but the special ability of being able to recognize and remember them seems to be relatively independent of pure "brains." The most intellectual fourth of about one hundred and fifty college students remember only 10 per cent more names and faces than the least intellectual fourth, whereas they are usually able to make useful observations of human behavior 40 per cent better, and greatly surpass their less intellectual classmates in selection of the most tactful solution of a social problem.

The test of *Social Information* includes fifty true-false questions. The fact that extent of social information is highly correlated with social intelligence is indicated by the fact that higher scores are made by those groups of individuals known

to be socially intelligent. Scores above average are made by executive groups of employees, and among students, by those who are greatest participants in extra-curricular and social activities.

On the whole, the information of the average individual is not very great, indicating perhaps a tendency to limited or specialized interests. For the highest groups tested, average social information attainments are below one-half of a perfect score.

The most interesting thing about the analysis of social information is the differences which are found to exist among the different types of information. The types which prove easiest for people, in general, are those on magazines and automobiles with questions dealing with sports and moving pictures also high in popular knowledge. Knowledge of science and literature, art and music is relatively small as compared with other types of knowledge included. Some idea of the relative extent of popular information of various types is gained by noting that the average difficulty of the questions dealing with automobiles is 74 per cent of correct answers, while the average percentage of individuals knowing those dealing with literature is only 41 per cent.

A comparison of the relative number of persons in different groups who know certain types of information is also interesting. Questions of sport are usually answered correctly just as often by a rather low grade industrial group as by college students. The industrial people usually equal college students also on questions of travel. But when it comes to scientific interests and knowledge of etiquette, the college group far outshines the others. We can conclude, in general, that all groups of individuals possess some social information, certain groups are markedly superior to others, and the kind of information possessed varies somewhat from group to group.

More than is the case with other components of social intelligence, a fund of social information can be consciously acquired. Constant effort toward building up such a fund of information can noticeably increase one's appreciation of the

topics he hears in conversation. Another indication that social information is built up through definite experiences and contacts, is the change in this respect with change in the age of the individual. The social information of the adult is quite different from that of the child both in amount and type.

Judgment in Social Situations or keen insight in the analysis of problems of human relationship, and superior judgment in how to solve them, is an almost infallible indication of high social intelligence. Those individuals who have been termed highly intelligent socially, either because of their positions vocationally, or because of their participation in campus activities as students, all show noticeable superiority in this type of social judgment.

On analysis, the judgment test presents three distinct types of questions—those presenting purely social problems or problems of personal relations; those presenting business relations; and problems of judging human nature. On the whole, those of the purely personal relation type proved easiest; those requiring judgment in business situations most difficult. In this connection, it is worth while to compare the college students with the high grade industrial groups made up largely of those who are constantly facing the business type of situation. In most instances, difficulties of the questions are about the same for the two groups. In the few instances when the executive group falls considerably below the college group, the questions are usually of the purely social or personal type rather than the business type. This would tend to bear out the actual superiority of the executive group in handling executives' problems.

Taking another factor, it is found that the ability to size up the mental reaction of an individual from his *Facial Expression* or from his words is highly correlated with social intelligence. In a group of several hundred students the upper half in social intelligence as a whole, scores one-third better in this ability than does the lower half.

People differ in their ability to judge emotions from facial expression and the same person usually differs in his ability to judge different emotions. With the same portrayals of emo-

tions, in college groups some recognize fewer than two out of twelve while a considerable number are able to recognize all the emotions. The college group is typical of other groups as well. In each there are a few individuals for whom facial expression is no indication of what's behind the face, and also a few others for whom "to see the face is to know the mind."

Analysis of the results on the test for this ability indicates the extent to which the various emotions differ in the difficulty of judging them from facial expression. Individuals fail to judge scorn correctly twice as often as they fail on contentment; and the failure on astonishment is three times as great as on delight. The two most easily recognized emotions are delight and physical suffering; two very difficult ones are astonishment and suspicion. The easiest ones are, in general, those which are often needed; the difficult ones are usually those less frequently needed.

Those who fail to recognize the emotions may see no unusual expression in the face full of emotion, or they may recognize a deviation from normal but confuse the emotion which is expressed. Too often, the latter is even worse than the former. Reactions will be entirely wrong if one responds to an emotion as one radically different from the one actually expressed. The test shows that those emotions which are most confused are Astonishment, Terror and Rage; Determination, Suspicion and Scorn; Grief, Physical suffering and Terror; Contentment and Delight.

People find it more difficult to determine the *Mental State of a Person from his Words* than from his facial expression. In general, those who are most adept at recognition of emotional states from the face are adept at recognizing them also from the word. In actual life we most often find the two combined with an addition of tone of voice and bodily movement; but nevertheless, the two are quite separate factors.

It is found that those mental states easily recognized from words are more often pleasant emotional states, while those which are difficult to recognize are much more often unpleasant emotional states. Love, Admiration, and Determination are

among those easily recognized; Jealousy, Scorn, and Remorse among those hard to recognize. As in judging emotional states from facial expression, so in judging them from words, various emotions are confused. Of all the emotions, jealousy was most often confused with other states. It is found to be frequently confused with despair, envy, hate, rage, regret, and remorse. Others frequently confused are Disgust, Scorn and Hate; Regret and Remorse; Loneliness, Despair, and Remorse.

The test of *Observation of Human Behavior* shows no remarkable differences from group to group, except that the test is very much more difficult for the lower grade groups. College students prove to be fairly accurate in their generalizations, being pretty good judges of the tendencies of human nature and of the motives behind various types of human behavior. The average difficulty for questions of this test is 79 per cent of correct answers for the college students. Highest groups of industrial employees, those of the executive class, show an equally high ability in observation of human behavior. Groups of employees including those whose positions demand some ability in dealing with people, such as groups of teachers, stenographers, salespeople, and clerks, show an ability in observing human behavior represented by 55 per cent average difficulty of questions. With lower groups of industrial employees in positions where there is no need to meet or deal with people, a question of only 40 per cent correct answers is of average difficulty. The low industrial group is relatively lower in ability to make correct observations of human behavior than in any other trait of social intelligence.

RELIABILITY OF THE TEST

Results obtained in using the Social Intelligence Test indicate that its reliability is sufficiently high. One hundred college sophomores took form 1 of the test twice, four months apart, the test being administered by two different persons. Scores on the two different trials correlate 0.89. For 129 college students in another university, correlating scores on odd ques-

tions with scores on even questions and using the Spearman prophecy formula (Brown's) for predicting reliability of the whole test, the reliability is 0.88. Scores on form 1 correlate with scores on form 2 of the test 0.85.

VALIDITY OF THE TEST

To know the extent to which the test actually measures ability to deal in human relationships it is necessary to have some measure of social intelligence with which to compare scores. As would be expected, it has been difficult to find such a measure sufficiently objective and reliable to use in correlating scores. Since very few quantitative studies of this ability have been made, largely because of lack of means to measure objectively "adeptness in handling people," adequate measuring devices for establishing a criterion have not been easily available.

One means of obtaining a definite measure of complex traits for which it is impossible to obtain test measures is through personal ratings by competent persons who know the individuals to be rated. Ninety-eight employees in a large sales company, who took the Social Intelligence Test, were rated by a superior executive who had had good opportunity to know their ability to deal with people. The ratings on a seven-point scale correlated with Social Intelligence Test scores 0.61. Seventy-five per cent of those making above average scores on the test were above average in ability to get along with people as rated by the judge.

Study has also been made of the relationship between test scores and ratings of students, student ratings representing a combination of teacher rating and sorority or fraternity rating. The students represent those prominent in campus and fraternity activities, and ratings of their ability in dealing with others were obtained from fraternity members. The study gave positive results but somewhat lower than for the industrial rating study, correlations averaging about 0.40.

An important criterion of comparison which has been selected in the case of students is the extent of participation in extra-

curricular activities. The activities listed for study are those in which participation is entirely voluntary and aside from class work, including the following: athletics, dramatics, literary society, class officers, student publications, debate, glee club, fraternities or sororities, and participation in social functions. The assumption has been that extra-curricular activities are an indication of the sociability of the student or the skill with which he deals with his fellow students. It would seem that this is a safe assumption since extra-curricular activities depend directly upon association and dealing with fellow students. The student who is unable to adjust himself to the actions of others or who does not like to engage in pursuits where he must manage relations with others, is not often a full participant in campus activities.

TABLE 2

NUMBER OF ACTIVITIES	Q_1	MEDIAN	Q_3
Four or more	105	116	125
Three	97	112	121
Two	101	110	124
One	92	105	117
None	83	99	113

Of 262 freshmen students taking full time university work, 90 of the students engaged in no extra-curricular activities, 59 in one, 62 in two, 31 in three, and 20 in four or more. Table 2 gives the scores on the Social Intelligence Test for the different groups.

The separate parts of the test also indicate a relationship between scores and student participation in campus life. The two parts showing highest relationship were Judgment in Social Situations and Memory for Names and Faces, the first showing an average score of 22 for participation in three or more activities as compared with 17 for those participating in none, and the latter 18 as compared with 15.

In one of the southern girls' colleges test results were available on about fifty girls selected from those prominent in campus

and school activities. The average score for this group is 117 as compared with an average score for all students of similar scholastic standing of about 10 points lower.

The test seems to be measuring something important in determining participation in campus organizations and activities. Such a result is not obtained with other measures of student ability, as given in general intelligence tests, grades, and scholastic honors.

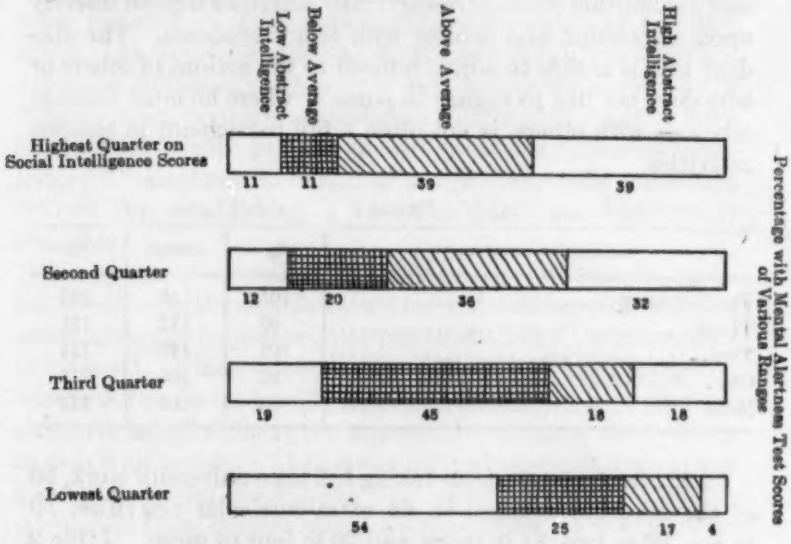

FIG. 1. RELATION BETWEEN SOCIAL AND ABSTRACT INTELLIGENCE

Separate activities do not show anything noticeable in average score differences. Athletics, social functions, and fraternities give average scores respectively of 109, 109, 112; the first two about the average for participation in extra-curricular activities at all, the last somewhat higher.

HOW SOCIAL INTELLIGENCE IS RELATED TO OTHER FACTORS

1. To abstract intelligence. Among college students the highest quartile in Social Intelligence Test scores includes

hardly more of those superior in abstract intelligence than does the second quartile in Social intelligence. This is what might be expected in the case of reliable measures of these two abilities. A certain amount of abstract or general intelligence is very likely a component of social intelligence. But the relation between the two is not so great as to indicate that the person of very superior intellectual ability will have a much greater chance of succeeding in purely social relations than his fellow of more nearly average intellect. Beyond a certain amount of general ability, high intellectual ability does not insure high social ability.

Correlations between Social Intelligence Test scores and abstract intelligence test scores for college students average about 0.50. The correlations of the Social Intelligence Test with tests of abstract intelligence taken by various groups of college students are as follows:

With George Washington University Mental Alertness Test	0.54	(243 Freshmen)
With O'Rourke College Entrance Test	0.57	(102 Sophomores)
With Thorndike College Entrance Test	0.42	(118 Freshmen)
With Brown University Test	0.56	(96 mostly Freshmen and Sophomores
With McCall Multi-Mental	0.25	(130 advanced students)

The correlation is fairly high but it is far from perfect. A positive relationship between abstract and social intelligence was to be expected. It can readily be conceived that there may be highly intellectual persons, so far as abstract intelligence is concerned, who have little or no gift at getting along with others. But on the other hand, it is not readily supposed that the individuals with highest social intelligence would be greatly lacking in general mental ability.

2. To mechanical intelligence. Social Intelligence Test scores correlate 0.22 with mechanical intelligence as measured by O'Rourke Mechanical Aptitude Test (130 high school students)

and 0.11 with mechanical intelligence as measure by the MacQuarrie Mechanical Ingenuity Test (126 college students).

As Thorndike has pointed out, there seem to exist three fairly distinct types of intelligence. Abstract intelligence is somewhat related to the other two, mechanical and social; while the latter two are almost zero in their relation to each other. There are undoubtedly individuals who excel in one or the other of the three types without being at all outstanding in either of the other two. This has been quite frequently the case in the individuals studied.

3. To age. Certain of the factors in social intelligence show a noticeable increase with age, others very little. The breadth and variety of interests of the older individual are usually found to be greater and he makes a higher score in Social Information. From high school to college groups, in which age is one important difference, the average score in Social Information is increased 50 per cent as compared with increases of less than 15 per cent in Memory for Names and Faces, and Interpretation of Emotions from either expressions or spoken words. The older individual is also usually more accurate in his judgment in dealing with social situations; but in this respect, his increase is off-set by a loss in speed. The younger individual tends to make his judgments in social problems more quickly though he is often less accurate.

On the whole, social intelligence does not seem to depend markedly on age. The average Social Intelligence Test scores of several hundred college students of different ages vary within only a few points out of 160. And the scores of high school students do not vary much with age. Social intelligence seems to increase somewhat regularly from early childhood to the age of about seventeen or eighteen; after that age makes very little difference. Table 3 shows average scores for different ages.

The child who is superior in managing relationships with his playmates probably starts with an advantage in managing human relationships in later life. Indications are that where unusual changes in social intelligence come with age, certain

experiences rather than age are important. Age itself does not build up social intelligence.

4. To sex. As indicated by the test of social intelligence, women are of higher social intelligence than men. On total score for the test, an average constant difference between the sexes of somewhat over 5 points out of 160 is found. On the separate parts of the test the sexes do about equally well on

TABLE 3

GROUP	AGE										
	13 years	14 years	15 years	16 years	17 years	18 years	19 years	20 years	21 years	22 years and over	30 years and over
Upper class college					113	112	112	112	108	114	114
College freshmen					105	105	98	101	99	100	105
High school students	82	84	88	92	89	88					

TABLE 4

TEST	FRESHMEN		UPPER CLASS	
	Male	Female	Male	Female
Total score	101	108	109	115
Part 1	18	21	21	23
Part 2	17	17	15	16
Part 3	22	23	24	24
Part 4	12	16	16	19
Part 5	13	11	12	11
Part 6	20	21	21	22

Memory for Names and Faces, Recognition of the Mental State behind Facial Expression and the Spoken Word; men are superior in Social Infomation; and women surpass in Judgment in Social Situations and in Observation of Human Behavior. An analysis of scores for 430 college students indicates the sex differences shown in table 4.

The results found seem to be in accord with popular opinion. Popular opinion grants to woman a greater need to get along

with people, it attributes to her a greater interest in social affairs, and a tendency to manage in a more acquiescent manner situations in which the men would argue or fight. And psychological studies have pointed out woman's greater interest in people as compared with man's greater interest in things.

STANDARD SCORES ON THE SOCIAL INTELLIGENCE TEST

Norms on the Social Intelligence Test are reported, based on over 6,000 students in educational institutions and on over 1,000

TABLE 5

Norms on Social Intelligence Test

	NUMBER OF CASES	MEDIAN SCORE	Q
School groups:			
High school students	618	83	14.0
College freshmen	4,181	102	13.5
Upper class college students	1,000	111	12.0
College graduates	100	113	12.0
Industrial groups:			
Administrative and executive employees	100	117	10.5
Teachers	250	112	10.0
High grade secretarial employees	50	111	12.5
Salesmen	25	107	14.5
Engineering employees—draftsmen, electricians, etc	45	105	14.0
Clerical and stenographic employees	200	95	13.5
Other lower grade office workers and helpers	300	84	11.0
Sales clerks in department store	35	81	16.0
Nurses	75	78	12.0
Lower grade industrial workers	150	65	20.0

individuals in various industrial groups. It is believed that the various groups are fairly typical; scores from 20 different educational institutions are included, and from over a dozen different organizations. In a few instances it might be said that selective factors have tended to make scores for certain of the industrial groups too high, but to no great extent.

Table 5 gives the composite norms for the different school levels of ability and for the different industrial groups.

Norms on the test are indicative of its validity. Those occupations where it is of primary importance to be able to deal amicably with others, such as positions of salesmanship or executive and administrative positions, show scores considerably above average for vocations in general; while those occupations where such an ability is of minor importance show lower scores.

The practical use that may be made of the norms on this test will be determined largely by individual conditions existing in each school or institution. It is generally to be considered doubtful whether the students below the twenty-fifth percentile will make good all the way through a college course. Where these individuals are also low in abstract intelligence, as is often the case, guidance into proper channels outside of college work is often to be considered the most feasible method of handling the situation. But where the individuals have relatively high abstract intelligence, the problem becomes one of guidance into the proper work in college looking toward a vocational pursuit in keeping with the students' abilities.

For practical use in industry, where there are sufficient numbers of applicants, efficiency would demand that only those who make scores equal to or higher than the median of the present groups be accepted as workers; certainly those below the first quartile should be accepted as employees only as emergency demands or as other qualifications more than make up for the deficiency. Those employees above the third quartile score are to be considered as most desirable for promotion to positions of higher leadership requirements, considering each individual case, of course, in the light of other capabilities necessary for the performance of the work.

THE RELATIONSHIP BETWEEN SOCIAL INTELLIGENCE TEST SCORES AND SCHOLARSHIP

College scholarship depends upon a variety of factors. No one measurement obtainable at the present time gives anywhere

near a perfect correlation with scholarship. Abstract intelligence has already been satisfactorily demonstrated to be one of the more important of these factors. Social intelligence is also important. Whether social intelligence *should* enter materially into college marks or not is another question—at present, under the grip of subjective marking systems, it *does*. Ability to understand and know the professor does count; inability to understand him, or express refusal to adjust to him,

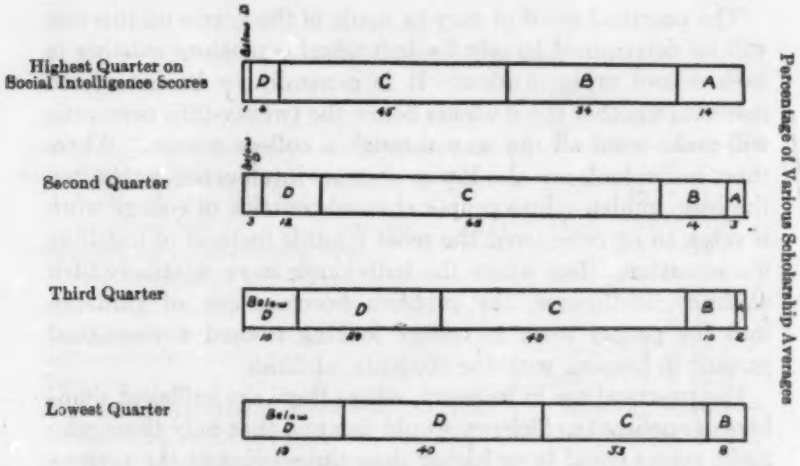

FIG. 2. RELATION BETWEEN SOCIAL INTELLIGENCE SCORES AND SCHOLARSHIP. FRESHMEN

does seriously handicap college marks. Only in those classes where objective marking is used almost entirely does abstract intelligence predict scholarship markedly better than do scores on the Social Intelligence Test. The study and use of measures of social intelligence in testing of college students offers the possibility of furnishing further impetus to improvements in systems of college marking.

In view of the conditions and circumstances of college grading it was expected that any measure of ability to deal with people would correlate positively with scholarship. The cor-

relation between Social Intelligence Test scores and freshman scholarship for 416 full time students at George Washington University is 0.47; for 161 upper class students scholarship for one year correlates 0.49 with Social Intelligence Test scores. For 137 high school students the correlation is 0.42.

The percentage of various scholarship averages for different levels of social intelligence are indicated on the accompanying chart. For purposes of computing scholarship averages, a grade of A was represented by 5, B by 4, C by 3, D by 2, E by 1, and Failure by 0. The sum of the grades for each student was divided by the number of subjects to get the final average.

The correlations between abstract intelligence test scores (George Washington University Mental Alertness Test) and scholarship for these groups are somewhat higher, 10 or 12 points higher. The most noticeable difference between predictive value of Social Intelligence Test scores and predictive value of abstract intelligence test scores is in the low range of ability. The student who falls in the lowest quartile of Social Intelligence Test scores has a much better chance of making the grade in college work, than the student who falls in the lowest quartile in abstract intelligence. The best combination is high both in abstract and social intelligence; but if one must be low, the combination of low abstract intelligence and high social intelligence is worse than low social and high abstract intelligence, so far as college grades are concerned.

VOCATIONAL USE OF THE SOCIAL INTELLIGENCE TEST

By giving the test to a sufficiently large number of individuals in various occupational groups, standard scores can be established for these groups. Such scores, established by measuring those who have already attained success in the vocations can be used as standards in admitting new employees or members to the group, since social intelligence is largely a quality to be possessed on entering the vocation—not one to be built up by experience in the position requiring it.

Provisional standards have been established for those vocations given in the table of norms. As would be expected, em-

ployees in administrative and executive positions score the highest of the occupational groups. The daily pursuits of these individuals demand the ability to get along with others, the ability to carry on business relationships with other executives, and the ability to deal with employees under their direction. A superior ability in dealing with people is the chief requirement for success in such vocations, assuming sufficient general ability to manage the details of the job. About 90 per cent of those who are successful in executive and administrative positions make scores on the Social Intelligence Test as good or better than the average score of employees in positions where no occasion arises for direct dealing with others. The vocations where the lowest scores are found are those which practically never require initiation of social relations and which seldom require the completion of those initiated by others.

Within the various occupational groups, the highest scores are, in general, indicative of the greatest success. Scores have been studied in relation to various factors which may be an indication of success. Studied for teachers, with 115 teachers taking work at a western university, Social Intelligence scores correlate slightly positively with salary, 0.13. With 34 employees in positions of an executive nature correlation of scores with salary is 0.17. Salary, if an indication of success at all, is, of course, only a very crude measure. With the group of teachers, scores correlate with teaching experience 0.27.

Probably the widest use that a measure of social intelligence can serve is in vocational guidance for individuals not yet quite to the vocational stage of life. In other words, such a measure will be of most value if it is possible from its use to predict, before the individual actually tries his hand at it, which person will be able successfully to manage human relationships that he must meet in the vocational world. Studies of the Social Intelligence Test indicate, to some extent, the possibility of such predictions.

THE INTELLIGENCE AND ACHIEVEMENT OF NORMAL SCHOOL STUDENTS

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The use of psychological tests as a method for selecting students who give some evidence of teacher-fitness has been somewhat limited. For some time, the importance of more exact measurement to ascertain intellectual capacity has been recognized in colleges and universities. The Normal Schools and Teachers Colleges have lagged somewhat behind, admitting without question those students who present the proper credentials, and after entrance failing to classify the students into homogeneous groups for purpose of instruction. In the great majority of teacher-training institutions there are three bases for admission—first, preparation; second, health, and third, character. Within a comparatively short time a few schools have required entrants to take an intelligence test to determine whether or not the candidate for admission has intelligence enough to profit by the instruction given. Such tests have in no way led to a discontinuance of the three standards of admission mentioned above, but have had the fortunate effect of supplementing and amplifying the school records and character ratings submitted by the entering students. In addition to the uses indicated above, the general intellectual level of prospective teachers is a matter of common interest to parents and tax payers. In this day and age, when the higher levels of education are rapidly being filled by great numbers of students, a plan for safe-guarding the pupils who will later be taught by them commends itself to thinking persons and seems wholly justifiable. This is indeed an assumption based entirely on the proposal that those persons who are entrusted with the instruction of the youth of our land should have at least average intelligence.

In general the matter of admissions to the Normal School leaves much to be desired. A process enabling administrators to more accurately select the student personnel would be welcome. If such were available, the most useful instrument for measuring entering students would differentiate at the outset with a minimum of error; first, those whose probability of success is great; second, those whose probability of success is little.

But, in the absence of such a test, Normal School authorities are forced to use means of testing teacher-power or capacity which do not involve the novel and characteristic elements of the profession, except as intelligence has been designated a factor in the trait. Thus, intelligence tests are applied to ascertain the general level of mental maturity, on the assumption that this quality, probably above all others, operates in the future success of a student preparing for the teaching profession.

Rich and Skinner (1) report correlation between grades received in a course in educational psychology and the National Intelligence Test. In the three groups of students studied, the following coefficients of correlation resulted: primary 0.33; intermediate 0.25; junior high 0.45. Correlations between the grades in educational psychology and the Meyers Mental Measure for three groups were: primary 0.17; intermediate 0.24; junior high −0.03. The investigators say:

> Our own results and those of others that we have mentioned suggest that before intelligence or achievement testing can render full service to the normal schools there is need for a detailed study of the relations between intelligence and success in teaching. It is tolerably certain already that the greater number of existing intelligence tests offer little information of value in normal schools, however useful they may be in the other parts of the educational ladder. There may, in fact, be opportunity for valuable service from some person who will devise a special normal school intelligence test.

Assuming that the National Intelligence Test really measures the intelligence of students of this age-level and maturity, it is a matter of some importance to educators and parents that such discrepancies exist. Just what is the cause of these low coeffi-

cients one can only guess. It might be inferred that the course in educational psychology was keyed to the students of low intelligence in order that they might pass while the bright students failed for no reason of real ability but because of laziness and general indifference. Interest and effort on the part of these whose scores were low might have been greater than with the high group, but it would seem improbable that these attributes would effect the correlations so markedly.

Gambrill (2) reports a correlation of 0.56 P.E. $\pm$0.03 (foot rule formula) between first semester marks and the Thorndike Intelligence Test scores with the Trenton Normal School students. The desirability of prophesying success in actual teaching is great but intelligence scores aid very little inasmuch as the correlation between practice teaching marks and intelligence scores was 0.11 P.E. $\pm$0.05. Retests were given a year later to 169 students, the coefficient of correlation between the two sets of scores being 0.86 P.E. $\pm$0.01 (Pearson formula). This coefficient gives some proof of the reliability of the test. Wood (9) has also indicated that the one significant factor among others which would commend the Thorndike test for wide use is its freedom from coachability.

Holmes (3) used the Otis Advanced Intelligence Examination Form A with Normal School students, and found the median score of certified students 156; the median score of uncertified students 155; the range of scores, certified students, 109–206; the range of scores, uncertified students, 92–206. In comparing Normal School achievement with the rank in general intelligence when the grades in the various subjects were translated into numerical equivalents the following results occurred:

Certified Students' averages	4.083
Uncertified Students' averages	3.833

Holmes says, in speaking of the relationship between general intelligence and normal school achievement:

> Very little difference was found between the scores of the intelligence tests of the certified and those of the uncertified students. The median score of the first group was found to be only one point above that of the

latter group. Forty-seven and eight-tenths per cent of the scores of the certified students were above 156, while 44.8 per cent of the uncertified group were also above the same score.

The use of the Thorndike Intelligence Test has been more general in the College and University than in the Normal School field. Wood (8) reports that it has been found to be the best single criterion for admission to college and that "it predicts success as accurately as the first year in college predicts the success in the second year, that is 0.67 as compared with 0.70." However, Hughes (4) found a correlation of 0.24 between the Thorndike Test and University Achievement (9 Stanford freshmen). The student who had the lowest Thorndike score ranked third in achievement, while the student who was second in the Thorndike test ranked fourth in achievement.

Whitney (6) has made a careful study of the traits involved in successful teaching. After setting up a criterion he weights intelligence, academic marks, etc., and shows the contribution of each in terms of the assumed criterion. The following coefficients of correlation between intelligence (Army Alpha and Thorndike) are: with secondary record (an average of all high school marks earned during a four-year course) 0.314; with academic record (an average of all marks in Normal School subject matter courses) 0.343; with professional record (an average of all marks in Normal School courses in education, educational psychology, and the like) 0.327; with student teaching success (an average of ratings in practice teaching made by the training school faculty) 0.160; with physique, (a checking of such items as chest expansion, posture, lung capacity, weight, general health) 0.201; with teaching success after graduation 0.025.

These data show a low correlation between intelligence test scores and the other factors involved in Normal School training. It should be noted that the correlation between intelligence and success in teaching after graduation approaches zero and that the other correlations are so low that it would seem unsafe to predict success in the Normal School on the basis of intelligence ratings.

In the early part of the fall semester entering students at the New Haven State Normal School were given the Thorndike Intelligence Test, Form S and Q Part III, and survey tests in the subject matter of the elementary school curriculum. The latter were examinations of the "new type," prepared, administered and scored by each department head. The subjects tested were: arithmetic, English, literature, and grammar, writing, art, history, geography and hygiene. Each examination contained about the same number of test-elements. The subjects were considered of equal importance, making it easy to compute the composite score and the rank of each student examined. Subsequently, the composite scores were correlated with the Thorndike Scores resulting in a coefficient of 0.53 (Pearson), ± 0.045.

In April the students (Juniors) were ranked in order of merit, ranks being based on the number of the honor points earned. In computing the rank of the student the following plan was adopted: four honor points for an A, three for a B, two for a C, and one for a D, and a minus one for an F. A course meeting three times a week in which a student received an A would bring the total number of honor points to twelve. Similarly a course meeting once a week in which the student received a final mark of C entitled the student to two honor points. The summation of honor points in accordance with this method, for each student, indicated his rank in the class. Correlations were computed between the Thorndike Intelligence Test score and honor points, the result being $0.175, \pm 0.05$. Table 1 shows the distribution of scores for the successful juniors and unsuccessful juniors.[1]

From the above table it will be interesting to note that 63 per cent of the "failures" are below the 50th percentile for the successful Juniors. Similarly 42 per cent of the "failures" are below the 25th percentile of the successful Juniors. Of the total number

[1] A successful Junior is one who "passes in her subjects and remains in school throughout the year." An unsuccessful Junior is one who fails in two major subjects and is subsequently dismissed from the school because of poor scholarship.

of "failures" three were above the 75th percentile of the successful Juniors. These data seem to indicate that the probability of failure is greater in cases where the Thorndike Intelligence score Part III is less than 100 than in those cases where it

TABLE 1

THORNDIKE SCORES PART III	NUMBER OF SUCCESSFUL JUNIORS	NUMBER OF UNSUCCESSFUL JUNIORS
200–209	1	
190–199	2	
180–189	0	
170–179	2	
160–169	7	
150–159	4	1
140–149	4	0
130–139	10	1
120–129	18	2
110–119	21	2
100–109	15	2
90–99	23	5
80–89	21	3
70–79	11	3
60–69	5	2
50–59	6	3
40–49	3	2
30–39	1	0
20–29	0	1

Successful (Juniors) Thorndike Test (154 cases):
Mdn. 104.16
Q1 ..... 85.4
Q2 ..... 124.78
Unsuccessful (Juniors) Thorndike Test (27 cases)
Mdn. 87.84
Q1 ..... 63.25
Q2 ..... 105.75

exceeds a hundred. The data also show that low scores on the Thorndike Intelligence Test do not necessarily predict a failure since a substantial number of students who were below the lower quartile has remained in school apparently successful in the courses pursued.

The extremely low correlation between intelligence and honor points (New Haven Normal School) leads one to suspect the accuracy of measurement in the various courses which the Normal School offers. In many Normal Schools the grades earned by the student in courses are dependent upon two factors first, ability to pass the examinations, often of the essay type; and, second, the judgment of the instructor as to the potential power of the student in the matter of teaching. In brief, the method of grading proceeds on the principle of disqualifying a student in subject matter courses, if the judgment of the Normal School instructor is one of doubt concerning the student's attitude toward teaching. Professional attitude is altogether too subtle and intangible to be left entirely to the personal opinion of Normal School instructors. Grades, therefore, should represent achievement scientifically determined, disclosing subject matter accomplishment apart from a prediction of professional success, as judged by teachers in regular classes.

SUMMARY

1. On the assumption that the Thorndike Intelligence Examination Part III measures what it purports to measure, it appears that success in Normal School as determined by ranks is not entirely dependent upon intelligence. Just what factors, such as health, ambition, economic status, etc., contribute to success is a question of importance which calls for investigation.

2. Teacher-fitness is apparently a "functional resultant" depending on a series of attributes as yet not wholly known. Since the correlations of intelligence with achievement are positive, it seems reasonable to assume that teaching capacity is in part dependent upon intelligence.

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A GRAPHIC SUMMARY OF THE STANFORD-BINET TEST

EDWARD B. GREENE

Psychological Laboratory, University of Michigan

This Graphic Summary form was developed for use of the Mental Testing Service of the University of Michigan Hospital to serve the following purposes:

1. The Graphic Summary enables one to make a quick analysis of the findings in a readily understandable form. Thus a glance at the form on page 345 indicates that the person tested was ten years old chronologically, that his mental age was ten years and ten months, that he was above his age by about four months in concrete relations, performance and mathematics, but retarded below his age by about one year in most of the language situations. *X* indicates passing while *0* shows a failure. This qualitative analysis has been found to be a great assistance in emphasizing the special abilities and deficiencies of patients, rather than the less discriminating IQ or mental age.

2. When the test is administered by an experienced person, the Graphic Summary, with the child's written responses on the reverse, serves as the only permanent record necessary. The longer form is sometimes used in special cases but it is not regularly found to be as useful as the summary. There is considerable saving of time in giving and scoring the test, and in the cost of the printed forms. The graphic summary costs about one-eighth as much as the longer form.[1] The graphic summary also allows the tester to follow a logical order in presenting the test rather than the grouping by mental ages.

[1] The Graphic Summary may be secured in packages of 100 at the rate of $1.10 per 100, postpaid, by writing to the Psychological Laboratory, University of Michigan, Ann Arbor, Michigan.

3. The Graphic Summary was designed to yield statistical results very rapidly. The cross lines enable one to find individual test or groups of tests without the use of a stencil. Thus the tabulation of several hundred cases may be made in a small fraction of the time needed when the longer form is used.

4. The Graphic Summary shows, in the numerous blank spaces, the need of supplementing the Stanford-Binet with other test material. It is perhaps generally felt that blank spaces of two or more years are not justified by careful testing practices. This need can be met by a number of individual tests now available for both general and special abilities.[2] Due to priority in the field and the ease of administration the Stanford-Binet will probably remain extremely useful and popular for some time, but it is well for testers and those who try to interpret the test results to realize its defects and to know the best ways of supplementing them.

A brief description of the Graphic Summary form follows:

At the top of the page is listed identifying information such as, "Name, born, age, school grade, clinic attended, patient's number, last previous test, examiner's name," and the general results secured from this test.

The central portion of the page has the type of test listed in the left hand column and the mental ages arranged serially across the top row. The title for each individual test together with the passing requirements and time limits are placed in the appropriate column and row.

The classification into types of test was based upon the type of situation or material used and in some cases upon the type of process which the subject is supposed to follow. Thus Group I includes situations which are generally included in tests of orientation. Group II deals with the interpretation of pictured material. Group III includes the use of such concrete material as lines, weights, geometric figures, paper cutting and folding, writing, copying, and the ball-in-field problem.

[2] For other tests consult F. L. Wells, Mental Tests in Clinical Practice 1926, or Healy, Bronner, Lout, Shimberg, Manual of Individual Tests and Testing.

Psychological Laboratory
University of Michigan
Ann Arbor, Michigan

GRAPH OF STANFORD-BINET TEST — Form L. S.-B. S/20

Grade _____
Examiner No. _____

Last previous test _____
Name Henry Hayes — 9/23/27 — 10-0 — 9/29/27
Date _____
Mental Age _____

Examiner KF — I.Q. 108 — Mental Age 10-10 — Grade Rank 4A

TYPE OF TEST	III	IV	V	VI	VII	VIII	IX	X	XII	XIII	XIV	XV	XVIII
1. ORIENTATION	Nos. 5 Last name 5		Age 5x1	Dr. hand 1 Fr. mar 1 3/3 age 5/6 Learning 5x1 differences	Pict. 5 wks ex 5/5 Chairs		Body Parts 5/5 Use 5/5 Fork, etc. 5/5			Imagination 5			
2. ATTENTION	3 objects 3 in one.		Association 3 on arrows	Retrieval 3/5	Reversal 3 5/5					Interest 2			
3. COGNITIVE DEFINITIONS	Recog. eye 3 Recog. hand 3/5	Allow 3 3/5 3/5 Pencil 5/5 4 Copy Sq. 4 1/2 pencil 5/5	Invisible 5 Handkerchief 1 min. work		Rem. Insect 5 1 min. Simples 5	Ball in Hole 5/5 Drive 5/5 From stick-pen.	Obedience 5/5	Ball in Hole 5/5 Copy Sq. 5/5 10 sec. 5/5	Ball in Hole 5/5 Imitation 5/5	Imitation 5 Fold Paper Diagonal 5/5	Coin 5 2 err. 5 min Diagonal 5-6 Pick-up-sticks Obj. work 5/5	Chair rot 5 No error Pronoun 5/5
4. LANGUAGE													
4.1 Vocabulary	Say pen 5 Recite nursery poems 5/5		Reform 5 No errors			20 words 5 X			20 Words 5 50 Words 5 1 min. 5/5	20 5/5	20 5/5	20 Words 5	20 Words 5
4.2 Information			Obj. Use 5 Pict. Hell Pencil, Tabl 5/5			Bullet 5 Tiger Football Soldier 5/5				Pict. Card 5 5/5			
4.3 Repeat sentences	5-9 syll. 5 5/5	13-15 syl. 5x1 5/5 5x1 5/5		16-18 5/5 5/5 err. 5					20-22 5/5			22 Syll 5-1 5/5, no err.	
4.4 Difference Designation					Pic-Fully 5 Glass-Wa Wood-glass Mat. 5/5	Food-meal 5 cup1-saucer fire-stove Whip-cake Pen. 5/5			Same-con-ma-stove Food-leather-leg Food-cotton-leather Knife blade-pump-stove Hose-potato -tree 5 5/5	Pres-ent 5 5/5	Less-ship 5 Re-1-ver-2 Poverty-Ric Short-Lengt Mat. 5/5		
4.5 Problem Meaning		Comparison 5 Lot, cigaret 5/5	3 Causes 5 no error	Comparison 5 Bad, Starved 5/5		Comparison 5 Just starved 5/5	Oral Comp. 5 5/5 7 min.	Comp. 5 5/5 5 min. 5	Discern 5 5/5 5/5 min	Problems 5 5/5		Changed 5 Passages 5/5
4.6 Reasoning							Pictures 5 5/5 7 min.	Absurd 5 5/5 5/5	Points Serious 5		Pattern 5 Score 5		
5. REPRESENTATION				13 pcs. 5 5/5	Diagram 5 No error	Diagram 5 20 to 0 1 err. 40 sec	Drawing 5 10-6 5x1 7-4 5/5				Puzzle 5 5/5	Backward 5 Digit 5/5 20 sec	Impossible 5 Cut 2 min trials
5.1 Problems		Formboard 5 4 pointers no error		Cubes 5 5/5		Cubes 5x1 6 correct	Drawing 5 10 min				Stereogram 5/5		
5.2 Repeat digits forward	2x1 5x1 5/5 5/5	2x1 5x1 5/5 5/5				2x1 5x1 5/5 5/5			5x1 6x1 5/5		2x1 5x1 5/5 5/5		2x1 5x1 5/5 5/5
5.3 Repeat digits backward						2x1 5x1 5/5 5/5			5x1 6x1 5/5	5x1 6x1 5/5 5/5		2x1 5x1 5/5 5/5	2x1 5x1 5/5 5/5
CREDIT Number	6-0 or 4-3	6-0 or 4-3	6-0 or 4-3	6-0 or 4-3	6-0 or 4-3	7-0 or 4-3	6-0 or 4-3	6-0 or 4-3	6-0 or 4-3	6-0 or 4-3	6-0 or 4-3	6-0 or 4-3	6-0 or 4-3
Score							12.	9.	6	12.			

REMARKS

Physique: Fairly normal progress; no special problems reported by parent teacher. Tendency toward obesity, enlarged tonsils & adenoids

Specific defects

Special environment

Conduct: (Rate 1 to 10, 5 for average, 10 for very good)

Application or attention	Rather boisterous and reckless. Tendency to giggle, and feel weights.
Cheerfulness	7
Self-reliance	8
Responsibility	3
Sociability	7
Cooperation	5
Total Rating	5

Group IV includes situations which emphasize the use of abstract language. These were arranged under the following headings according to the complexity of the response: Vocabulary and definition of isolated words, simple repetition of syllables, differences and similarities, sentence or context meaning, and reasoning or logical processes. Those who are familiar with the Stanford-Binet will notice that a rather large variety of unique tests are placed under Context Meaning, including V–6, IX–5, X–4, XII–4; and XIV–4, and that IX–6, Rhymes are included in Reasoning, while XIV–4, Problems of Fact, are placed under Context Meaning. The justification for this grouping lies in the belief that these unique tests resemble each other more than they do the situations found in other groups. There are justifiable differences of opinion concerning what processes are measured by these tests. Group V includes situations which emphasize the use of mathematical symbols classified under three headings: problems, digits forward, and digits backward.

The vertical arrangement of Groups on the sheet was designed to present them in the order in which one might usually wish to present them to the subject, starting at the top with the more familiar and concrete, and progressing downward toward the more abstract and complex language and mathematical material. The reasoning and mathematical problems were placed in adjacent rows, 4.6 and 5.1, to allow for their easy comparison.

Below the classification of tests are found rows showing the months to be credited for each performance and the actual credit gained.

Immediately below the credit rows are four blank rows to be used for scores of tests not included in the Stanford-Binet.

In the lower left hand corner is a small space for the main outstanding points in educational, physical and social history. In the lower right hand corner space is provided for a simple rating of conduct as shown by carefulness, shyness, distractibility, motility, coöperation, and mental grasp. The last factor is probably the only one which needs definition. "Mental grasp" was designed to show the examiner's estimate of how

well the subject understood what was asked of him and how well he criticised his own errors, that is, how often he knew when he was wrong. The actual numerical ratings are of course only suggestive since they are arbitrary units on an absolute scale, without any objective check. They are comparable only as a rough estimate when used after considerable training.

The reverse of the Graphic Summary was designed to provide space for all the written replies required in the Stanford-Binet test. These include:

IV–4. Copying Square
VII–6. Copying Diamond
VIII–1. Ball in Field
VIII–a–2. Writing from Dictation
X–3. Copying Designs from Memory
XII–3. Ball in Field
XIV–a–2. Path of Cannon Ball
XVIII–2. Paper Cutting

NOTES AND NEWS

The Austro-American Institute of Education in Vienna is again organizing a Summer School for English speaking visitors. The purpose of the School is to give an insight into present political, economic, social, religious and other cultural conditions in Central Europe. Art, Literature, Music and Education will be treated by experts in these fields. Among the lecturers will be included Dr. Adler, of Vienna; Dr. Milton Del Manzo of Teachers College, Columbia University; Dr. Paul L. Dengler, Director of this Institute; Professor Meister, University of Vienna, and others. The duration of the Summer School will be four weeks. Further information may be obtained by addressing The Institute of International Education, 2 West 45th Street, New York City, or The Austro-American Institute of Education, 1. Elisabethstrasse 9, Vienna, Austria.

The Child Study Association of America, in coöperation with Teachers College, Columbia University, will hold a two-day conference on Parental Education and the Public Schools at Teachers College, July 16 and 17. On Monday, July 16, from 10 to 12:30 a.m. the topics for discussion will be Parental Education Today—Its History, Status, Scope, Purpose and Aims; How Educable Are Parents; and How Parents Can and Do Affect the Character of Public Education. Tuesday morning the subjects will be: What a System of Public Education Can Offer in Continuous Parental Education; How Parental Education May Promote the Effectiveness of the Public Schools; The Function of the Parent-Teacher Association in Parental Education; and The Function of Study Groups in Parental Education. The afternoon sessions will be devoted to round-table discussions.

Dr. M. Liepmann, a leading German criminologist and Professor at the University of Hamburg, who has recently visited this country for the purpose of studying American prisons, will report his findings in a forthcoming issue of *Mental Hygiene*. "It is one of the strange contradictions of this country," says Dr. Liepmann, "in which commercial and public enterprises develop at a pace that takes one's breath away, that in the field of penal law and prisons, a number of institutions have been preserved that are more in accord with medieval times than with present-day America." Professor Liepmann considers the lack of

training of prison officials for their work and the relative absence of occupation for prisoners two of the most serious indictments of the American prison system.

Dr. Norman Fenton, Associate Professor of Psychology, Ohio University, has accepted the position of Director of the California Bureau for Juvenile Research at Whittier. He will also serve as editor of the *Journal of Delinquency*. He has been relieved of his duties in the Summer School at Ohio to take up his new position on July 1, 1928.

The Science Press announces the recent publication of the Fourth Edition of *American Men Of Science*, a biographical directory, containing the records of 13,500 living men of science. This volume, containing 1132 pages, has been edited with much care and should be of great value to those who are directly or indirectly interested in scientific work. This book may be secured for $10.00 from the Science Press, Grand Central Terminal, New York City.

The first issue of the Loyola Educational Index, a complete subject and author index to education and psychology, is ready for distribution. Periodicals listed include all the leading educational and psychological journals of a strictly scientific nature published in the English language. It will appear in five issues per year. The price is $15.00. The editor-in-chief is Austin G. Schmidt, Ph.D., Dean of the Graduate School and Head of the Department of Education, Loyola University, Chicago.

BOOK REVIEWS

HELEN HECKMAN. *My Life Transformed.* The Macmillan Company, New York, 1928. Pp. xii + 202.

This is an autobiography of a deaf girl written in a simple style without any attempt at scientific accuracy. It is, therefore, an interesting human document, but of little value to the psychologist who is interested in the scientific study of the deaf. If psychological tests had been made at stated periods during this child's life, how extremely valuable would these have been, because it would seem as if we had here to do with a child of exceptionally high intelligence.

Helen was born in 1898 and became deaf from spinal meningitis at eleven months. It was two years afterwards before the parents realized that the child was totally deaf. From this time up to her twelfth year she spent the time at home and in a state institution for the deaf receiving the kind of education that is the common lot of most deaf children at the present time. Her memories of this period are interesting and give suggestions as to the reasons for the emotional outbursts so common among deaf children.

At about twelve years of age Helen was taken out of the institution and educated privately by her step-mother. The rest of the book describes what this remarkable woman accomplished. She literally devoted her life to the education of this one child, and with no mean results. The step-mother was not a trained teacher of the deaf and she followed no specific "method." She used all her ingenuity in devising plays, games, exercises of all kinds, and with indomitable strength of will and singleness of purpose kept on with her task. She was determined to make Helen as normal a child as possible. With much interesting detail we are told how she taught Helen lip-reading, speech and writing. What we are told she accomplished in lip-reading and speech is all the more remarkable when we remember that this training did not start until the child was twelve years old. How painfully these things were accomplished is evident from Helen's account, and nothing but a remarkable teacher and an intelligent pupil could have reached the results finally attained. "So, day after day, countless repetitions of vowels and consonants and their blendings, and the corrections necessary to improve these principles, went on. And, day after day, hundreds of times words and simple sentences as I learned them, were given to me for lip-reading practice."

To counteract the monotone speech so common among the deaf, Helen was given instruction in singing. To counteract the poor physical posture, so common among the deaf, Helen was given instruction in dancing. In this she became quite an adept and gave many public performances. She says that she receives no aid from the vibrations set up by the music, but that she relies upon countering to keep the correct rhythm.

The book emphasizes, what all educators know so well, that much more could be accomplished with the deaf, if we had better and more teachers. We must not, however, deceive ourselves into thinking that all deaf children could be transformed into Helen Heckmans, even if they had the individual attention of so gifted and energetic a teacher as Helen's step-mother.

R. PINTNER,
Teachers College, Columbia University.

EDMUND S. CONKLIN. *Principles of Abnormal Psychology.* New York, Henry Holt and Company, 1927. 457 pp.

WILLIAM MCDOUGALL. *Outlines of Abnormal Psychology.* New York, Charles Scribner's Sons, 1926. 572 pp.

These two books present valuable attempts at systematizing the large and ever growing body of material in the field of abnormal psychology. If the first of the two by Professor Conklin is "designed for advanced undergraduate students in psychology," then the second, by Professor McDougall, might serve the needs of advanced graduate students, for the latter is much longer, is written from a somewhat technical standpoint, and requires a considerably greater amount of preknowledge of psychology for its mastery.

Professor Conklin's book is clearly written. He achieves detachment in his critical treatment of theories and concepts in the field of abnormal psychology. Perhaps this is possible in his case because the book contains no doctrines peculiarly his own. Conklin tried rather to assemble the opinions and findings of others and to choose from among them such material as fulfilled the needs of beginners in the subject. He treats interestingly and with wide quotations the following topics: abnormalities of senses, memory and thought; the psychoses and psychoneuroses; "shell shock," multiple personality, hypnotism, spiritistic phenomena, sleep, dreams, effect of drugs, and problems of exceptional endowment, such as the feebleminded and genius. The last chapter contains an historical and biographical sketch of the subject. The book is decidedly a contribution to the problems of the teaching of abnormal psychology to undergraduates and others just beginning the study it is, furthermore, a textbook that students will enjoy.

Professor McDougall had a harder problem before him. He has presented in an individualistic and decidedly "non-textbook" fashion his own views of the various problems of abnormal mentality with which he has grappled for years and to which he himself has contributed many new insights. Readers of his book will be interested in a statement in his Introduction to the volume: "I believe that Professor Freud has done more for the advancement of psychology than any student since Aristotle" (p. viii). However, the reader will soon learn that McDougall has by no means accepted all of Freud's doctrines; his trenchant and suggestive criticisms of what he believes to be many of the vagaries of Freud's doctrines and those of Freud's disciples are still present in his discussions of psychanalytic theories and concepts. The subjects covered in the book parallel somewhat those in Conklin's text, though by no means in the same order. McDougall goes into much greater detail; the method of exposition is rather encyclopedic.

NORMAN FENTON.
Ohio University.

ALFRED ADLER. *Understanding Human Nature.* (Trans. by W. B. Wolfe.) New York, Greenberg, Publisher, Inc., 1927. Pages xiii, 286.

Bound in red, marked with gilt letters, the upper edge a sickly yellow, protected by a brilliant red paper wrapper with the title in huge white block letters heavily underscored,—nothing seems to have been omitted in the effort to make this volume catch the eye of the book-store wanderer. And for such the volume is best suited. It is a translation of a series of lectures delivered by the author at the People's Institute in Vienna to "hundreds of men and women of all ages and professions." It is dedicated by the author to the "task of illuminating man's progress toward a better understanding of human nature." There is no index.

Psychologists who are already familiar with Adler's work will find nothing new in this volume. It is the familiar story of the inferiority feelings, the will to power, the satisfaction found in whatever exalts the self, and the great variety of adjustments to life of many degrees of sufficiency. Chapter and section headings all have a familiar ring; the soul, fantasy, dreams, feeling of inferiority, sex, family constellation, science of character, non-aggressive traits, affects and emotions, etc. One notes with interest that there is much more emphasis upon inferiority feelings consequent to the influence of the social setting and rather less upon organ inferiority. In fact the most notable feature psychologically is the pervasive emphasis upon environmental effects, especially social, upon the individual. The herd instinct is presented as an established fact. The term faculty is rather loosely used. Fantasy is presented as the "creative faculty of the soul." Prevision and prejudgment

are described as "essential faculties." Readers who are familiar with the early history of the psychoanalytic movement in Vienna will read with special interest the section on dreams which appears without mention of the name of Freud. Love is presented as at all stages of development directed toward others, quite different of course from the speculations of Freud. Hallucinations receive the psychogenic interpretation and are described as the "artistic creation of the soul."

Whether justly or not a volume of popular lectures inevitably gives the reader an impression of the lecturer himself. Through these lectures one seems to hear the voice of confidence unqualified in the assertions of that special school of psychoanalytic thinking. Again and again the scientific reader will be startled by assertions for which he wonders if there is any inductively determined basis, and seeks in vain for authenticating references. Dogmatism in popular lecturing is of course unavoidable, but it may be open to serious question if speculation and theory should ever be presented as fact and in the language of unquestioning confidence. There is an assurance and a loftiness in the style which is inescapable. The cosmic, the absolute (presented in three paragraphs), the soul, the goal of life, the science of character, the cosmic picture—the ease with which these and other terms of like moment are used give little intimation of scientific caution. One might even suspect in them some evidence of compensation for those feelings of inferiority against which the author lectures so valiantly.

EDMUND S. CONKLIN,
University of Oregon.

CHRISTIAN A. RUCKMICK. *The Mental Life—A Survey of Modern Experimental Psychology.* Longmans, Green and Co., 1928. Pp. x + 253.

The Mental Life is a brief account of the elementary facts and principles of psychology. It has been written for elementary courses and for individuals who are not enrolled in college.

Professor Ruckmick has organized the book so that it may be used alone in the short summer courses of our normal schools, colleges and universities or as an outline or introduction for the longer courses given during the regular academic year. As a text for summer school use the teacher and student will find in it simple and fairly comprehensive discussions of the topics ordinarily included in a general psychology. Successive chapters, for example, are devoted to: "Methods and Aims of Psychology," "Sensory Experience," "Perceptual Experience," "Imaginal Experience," "Affective Experience," "Attention," "Association," "Action," "Thought Processes" and "The Self." The teacher of the longer courses of the regular academic year will find the book more or less of an outline of the elementary facts of psychology. This sort of arrangement, as Professor Ruckmick points out, will give the lecturer an oppor-

tunity to supply most of the detailed facts in connection with his own theoretical background.

The book is unusually interesting and readable. It should be examined by all teachers who are giving short elementary courses in psychology. Students in our summer schools will welcome the contribution. For the courses covering the academic year the book may find a place as an introductory outline to be used in connection with one or more other texts. Individuals not enrolled in college and teachers who have not devoted much time to the study of psychology will find the book an excellent introductory survey of the subject. The well-selected list of references at the end of each chapter and the classified annotated list at the end of the book should serve as a guide for further reading.

JAMES VAUGHN,
University of Cincinnati.

JOHN B. WATSON. *The Psychological Care of Infant and Child.* New York, W. W. Norton & Company, 1928. 187 pp.

This is a handbook presenting rather briefly from the behaviorist's standpoint certain significant problems of child-care as well as general attitudes toward the psychological development of children. The seven chapters deal with the following topics: How the behaviorist studies infants and children, fears and how to control them, dangers of too much mother love, rage and temper tantrums, night and daytime care, what to tell the child about sex, and a final "behaviorist's apologia."

Watson summarizes his well-known findings regarding the paucity of situations which tend to arouse fears and rage in the newborn, explains in detail how the common conditionings of these emotions are acquired, and suggests methods of un-conditioning. The material is presented explicitly and simply, and should prove of great value to parents. There are many very helpful suggestions in the chapter on night and daytime care, although in proposing a schedule for the infant's care he fails to take into account the necessity for adjusting the child's schedule to the situation in his own home. He presents many excellent suggestions for teaching various useful habits and inculcating self-reliant attitudes in the small affairs of daily living. At least one of his suggestions, however, is open to serious question, namely, that every child should have a separate room of his own from birth to two years of age, neither mother nor nurse being allowed to sleep in the same room with him. "No mother has a right to have a child," he declares, "who cannot give it a room to itself for the first two years of infancy. It would make this a *conditio sine qua non.*" And in another place, "Unless these conditions can be met no woman should be blamed in my opinion if she refuses to consent to have a child." It is difficult to realize the justification for so extreme an attitude. Watson does not explain what dire results he

expects to follow from allowing a baby under two years of age to sleep in the same room with his mother or nurse; indeed, it remains to be proved that there are any. From the practical standpoint it seems to me highly desirable that an attendant should be close at hand to respond to even a slight stirring of the child during the process of training night-time continence.

Probably the section which will arouse greatest antagonism is that on mother love. On this point Watson is emphatic in the extreme. He explains his theory that all love responses originate from the stimulus of stroking, and that loves are "home-made," like fears and rages. He points out the evil results traceable to over-coddling in infancy, such as invalidism, over-dependence, "nest habits," inability to make marital adjustments. He then directs that all petting or caressing should be eliminated. "Never hug and kiss them (the children), never let them sit in your lap. If you must, kiss them once on the forehead when they say good-night. Shake hands with them in the morning. Give them a pat on the head if they have made an extraordinarily good job of a difficult task." Having tried this, he says, you will find yourself "utterly ashamed of the mawkish sentimental way you have been handling" the child. Now every psychologist will grant the possibility of unfortunate consequences from over-mothering children; they are well known to students of mental hygiene. But the fact that too much expression of love may be bad for a child does not necessarily imply that he should receive none at all (except, of course, for that one chaste daily kiss on the brow!). There is after all a middle ground, and Watson's attitude is extreme, especially in view of his own suggestion that marital happiness depends to considerable degree on proficiency in the art of love, which should, he proposes, be definitely taught in later adolescence. But will the adolescent whose childhood has been so untainted by any habits of affectionate demonstration be an apt pupil, or later a successful mate? The point is at least open to question.

The section on sex-instruction is frank, sensible, and helpful. In general, the book is very interesting, decidedly stimulating, and has many valuable suggestions. It is also decidedly irritating. It seems quite probable, however, that this is precisely what its author wished it to be. It bears a challenging dedication to "the first mother who brings up a happy child!"

H. ADDINGTON BRUCE. *Your Growing Child, A book of Talks to Parents on Life's Needs.* New York, Funk and Wagnalls Company, 1927. 405 pp.

The subtitle announces this as "a book of talks to parents on life's needs." It comprises thirty-three chapters on problems of mental and physical care of children in the popular "inspirational" style. A con-

siderable part of the material is quoted, directly or indirectly, from the extensive literature already extant on childhood. The book is freely interlarded with anecdotes and brief case studies. These add zest to its style, but are occasionally misleading, as they tend to a too optimistic outlook toward sudden and complete cures of mental difficulties.

The book is written in an easy, conversational style, at times somewhat diffuse and rather sentimental in attitude. The average parent will probably profit from many of its suggestions. It is purely a popular rather than a scientific contribution.

JESSIE CHASE FENTON.

NEW BOOKS AND PAMPHLETS RECEIVED*

Books and pamphlets for review should be sent to James P. Porter, Department of Psychology, Ohio University, Athens, Ohio.

An Analytic Study of Rational Learning. KARL C. GARRISON. George Peabody College for Teachers, Nashville, Tenn. 52. pp.

Brain and Mind. R. J. A. BERRY. Macmillan Company, New York. $8.00. 608 pp.

Child Care and Training. The Institute of Child Welfare. University of Minnesota Press, Minneapolis, Minn. $1.00. 180 pp.

The Commonwealth Fund: Annual Report—1927. 1 E. 57th Street, New York. 78 pp.

Education for Intolerance. JOHN E. J. FANSHAWE. Independent Education, 267 W. 17th Street, New York. 30 pp.

The Experience Variables. J. O. CHASSELL. University of Rochester, Rochester, N. Y. 25 cents. 42 pp.

Experimentation and Measurement in Religious Education. GOODWIN B. WATSON. Association Press, National Council Y. M. C. A., 347 Madison Avenue, New York. 295 pp.

A Glossary of Three Hundred Terms Used in Educational Measurement and Research. CHARLES W. ODELL. University of Illinois Bulletin, March 13, 1928, Urbana, Ill. 50 cents.

The Kuhlman-Binet Tests for Children of Pre-School Age. FLORENCE L. GOODENOUGH. University of Minnesota Press, Minneapolis, Minn. $2.00. 146 pp.

Living with Our Children. LILLIAN M. GILBRETH. W. W. Norton & Company, New York. $2.50. 309 pp.

Man and Civilization. JOHN STORCK. Harcourt, Brace & Company, New York. 449 pp.

The Mental Life. CHRISTIAN A. RUCKMICK. Longmans, Green & Company, New York. 253 pp.

Morton Prince and Abnormal Psychology. W. S. TAYLOR. D. Appleton & Company, New York. $1.75. 137 pp.

Psychological Care of Infant and Child. JOHN B. WATSON. W. W. Norton & Company, New York. $2.00. 195 pp.

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* Mention here does not preclude further comment.

Psychology of Abnormal People. JOHN J. B. MORGAN. Longmans, Green & Company, New York. 627 pp.

The Psychology of Character. A. A. ROBACK. Harcourt, Brace & Company, New York. $5.50. 595 pp.

Psychology and The Soldier. F. C. BARTLETT. Cambridge University Press, London. 224 pp.

La Selection Psychophysiologique des Travailleurs: Conducteurs de Tramways et d'autobus. J. M. LAHY. Dunod. Editeur, 92 Rue Bonaparte, Paris. 240 pp.

Studies of Mental Defects and Handicaps. J. E. WALLACE WALLIN. Miami University Bulletin, January 1924, Series XXII, No. 5. Oxford, Ohio. 75 cents. 177 pp.

The Teaching of Ideals. W. W. CHARTERS. Macmillan Company, New York. 372 pp.

Two Illustrations of Curriculum Construction. WALTER S. MONROE, DARWIN A. HINDMAN AND ROY S. LUNDIN. University of Illinois, Bulletin No. 39. Urbana, Ill. 50 cents. 53 pp.

A Work Book Syllabus in Principles of Education. ORLIE M. CLEM. Warwick and York, Baltimore, Md. $1.80. 170 pp.

Directory of American Psychological Periodicals (*Continued*)

Journal of Personnel Research—Baltimore: Williams & Wilkins Co. Subscription $5.00. 500 pages approximately. Edited by Walter V. Bingham, Lewis L. Thurstone, and Clarence S. Yoakum. Monthly.

Genetic Psychology Monographs—Worcester, Mass.: Clark University Press. Subscription $7.00 per volume. Two volumes per year, 600 pages each. Edited by Carl Murchison and an international co-operating board. Monthly. Each number one complete research. Child behavior, differential and genetic psychology. Founded 1925.

Psychological Abstracts—Princeton, N. J. Subscription $6.00. 600 pages ann. Edited by W. S. Hunter. Monthly. Abstracts of psychological literature. Founded 1927.

Mental Measurement Monographs—Baltimore: The Williams & Wilkins Company. Subscription $5. 400 pages annually. Founded 1925. Edited by Knight Dunlap and Buford Johnson. Published without fixed dates, each number a single research.

Studies in Psychology and Psychiatry—Baltimore: The Williams & Wilkins Company. Subscription $5. 400 pages annually. Founded 1926. Edited by Edward A. Pace. Published without fixed dates, each number a single research.

Journal of General Psychology—Worcester, Mass.: Clark University Press. Subscription $7. 600–700 pages annually. Edited by Carl Murchison and an international co-operating board. Quarterly. Experimental, theoretical, clinical, and historical psychology. Founded 1927.

Directory of American Psychological Periodicals

American Journal of Psychology—Ithaca, N. Y.; Morrill Hall.
Subscription $6.50. 600 pages annually. Edited by M. F. Washburn, K. M. Dallenbach, M. Bentley, E. G. Boring. Quarterly. General and experimental psychology. Founded 1887.

The Pedagogical Seminary and Journal of Genetic Psychology—Worcester, Mass.: Clark University Press. Subscription $7. 700 pages annually. Edited by Carl Murchison and an international co-operating board. Quarterly. Child behavior, differential and genetic psychology. Founded 1891.

Psychological Review—Princeton, N. J.: Psychological Review Company.
Subscription $4.25. 480 pages annually.
Bi-monthly. General. Founded 1894. Edited by John B. Watson.

Psychological Bulletin—Princeton, N. J.: Psychological Review Company.
Subscription $5. 720 pages annually. Psychological literature.
Monthly. Founded 1904. Edited by Samuel W. Fernberger.

Psychological Monographs—Princeton, N. J.: Psychological Review Company.
Subscription $5.50 per vol. 500 pp. Founded 1895. Ed. by Shepherd I. Franz.
Published without fixed dates, each issue one or more researches.

Psychological Index—Princeton, N. J.: Psychological Review Company.
Subscription $1.50. 200 pp. Founded 1895. Edited by Walter S. Hunter.
An annual bibliography of psychological literature.

Journal of Philosophy—New York; 515 W. 116th St.
Subscription $4. 728 pages per volume. Founded 1904.
Bi-weekly. Edited by F. J. E. Woodbridge and W[illegible] T. Bush.

Archives of Psychology—Sub-Station 84, N. Y.: Ar[illegible] Psychology.
Subscription $6. 500 pp. ann. Founded 1906. Ed. by R. S. Woodworth.
Published without fixed dates, each number a single experimental study.

Journal of Abnormal Psychology and Social Psychology—Albany, N. Y.
Subscription $5. Boyd Printing and Publishing Co. Edited by Morton Prince in co-operation with Floyd H. Allport.
Quarterly. 432 pages annually. Founded 1906. Abnormal and Social.

Psychological Clinic—Philadelphia: Psychological Clinic Press.
Subscription $2.50. 288 pages. Ed. by Lightner Witmer. Founded 1907.
Without fixed dates (9 numbers). Orthogenics, psychology, hygiene.

Training School Bulletin—Vineland, N. J.: The Training School.
Subscription $1. 160 pp. ann. Ed. by E. R. Johnstone. Founded 1904.
Monthly (10 numbers). Psychology and training of defectives.

Comparative Psychology Monographs—Baltimore: Williams & Wilkins Co.
Subscription $5. 500 pages per volume. Edited by W. S. Hunter.
Published without fixed dates, each number a single research.

Psychoanalytic Review—Washington, D. C.: 3617 10th St., N. W.
Subscription $6. 500 pages annually. Psychoanalysis.
Quarterly. Founded 1913. Ed. by W. A. White and S. E. Jelliffe.

Journal of Experimental Psychology—Princeton, N. J.
Psychological Review Company. 480 pages annually. Experimental.
Subscription $4.25. Founded 1916. Bi-monthly. Ed. by Madison Bentley.

Journal of Applied Psychology—Baltimore: The Williams & Wilkins Co.
Subscription $5.00. 400 pages annually. Founded 1917. Bi-monthly.
Edited by James P. Porter, Ohio University, Athens, Ohio.

Journal of Comparative Psychology—Baltimore: Williams & Wilkins Co.
Subscription $5. 500 pages annually. Founded 1921.
Bi-monthly. Edited by Knight Dunlap and Robert M. Yerkes.

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